

City of New Orleans

# Broadband Master Plan

Supporting New Orleans Goals for the 21st Century

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# Introduction

In an ideal world, all New Orleanians would have lightning fast broadband available at all times, the money to pay for broadband and related equipment, and the general and digital literacy and other knowledge to use broadband to accomplish personal, professional, and organizational objectives.

However, with regard to broadband, this is not an ideal world. Therefore, many residents, businesses, and non-profit organizations contend with subpar internet access due to:

- Physical unavailability broadband
- Inadequate broadband due to speed (bandwidth) and data transmission limits
- Unaffordable broadband

The report, **“Broadband – the World’s Newest Public Utility,”** discusses supply and demand factors affecting broadband access. Therefore, this report will not reiterate those ideas. Rather, this Broadband Master Plan outlines:

- A general approach to improve broadband access in New Orleans
- Resulting goals and objectives
- Specific strategies to facilitate broadband access by addressing supply and demand factors limiting broadband access among different stakeholders
- Information to help the City acquire resources needed to bring its Master Plan to fruition

The creation of a Broadband Master Plan supports goals in the City’s overall master plan, **“A Plan for the 21<sup>st</sup> Century: New Orleans 2030,”** adopted in August 2010. The overall master plan lists “state of the art telecommunications infrastructure, including broadband, fiber optic, wireless, and cable” as a goal for community facilities, services, and infrastructure. Furthermore, the overall master plan recommends that the City make capital investments and implement strategies to ensure the resilience of its communications and telecommunications infrastructure and “promote fiber to the home and upgrades of broadband technology.”<sup>1</sup>

This Broadband Master Plan outlines goals and strategies to help the City implement the broad objectives in the overall Master Plan. The development of these goals and strategies relied upon research conducted between September 2012 and December 2013. The research included:

- Surveys of City departments and public safety agencies (hereafter “departments and agencies” or simply “departments”) to understand their broadband needs.
- Conversations with Information Technology and Innovation (ITI) staff to determine how to satisfy departments’ broadband needs while also meeting their broadband goals for the City.
- Research on broadband availability, affordability, subscription, and adoption by New Orleans residents. Project staff utilized free data from the Federal Communications Commission (FCC) and the US Census for initial research. Before implementing the strategies contained herein, project staff should update the preliminary analyses using better data, which likely will need to be purchased.
- Research into methods other communities used to address their broadband needs, including obstacles to these methods and strategies to overcome the obstacles
- Research into laws and regulations affecting broadband provision in Louisiana to develop a list of possible methods for satisfying the unmet broadband needs of New Orleans residents

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<sup>1</sup> “A Plan for the 21<sup>st</sup> Century: New Orleans 2030,” Executive Summary, pg. 90.

Two reports, “**Broadband – the World’s Newest Public Utility**” and “**Broadband Around the World,**” document these research findings; therefore, the Broadband Master Plan will not repeat that information. Rather, this report will focus on the City’s broadband goals and steps the City can take to achieve those goals.

## **Limitations of the Broadband Master Plan**

As previously stated, in an ideal world, all New Orleans residents, businesses, non-profit organizations, and public sector agencies would have:

- Affordable access to the fastest high-speed wireline and wireless broadband available with current technologies
- General and digital literacy skills to use wireline and wireless broadband to accomplish personal, professional, and organizational objectives.

However, in reality, some New Orleans residents, businesses, non-profit organizations, and public sector agencies have access to broadband that is less than optimal in terms of speed (bandwidth), limits on the amount of data they can transmit, price, and other factors. Other New Orleanians completely lack access to broadband because they cannot afford it and/or do not have the skills to use it.

It would be a daunting task for The City of New Orleans government to ensure that every resident, business, non-profit organization, and public-sector agency has access to top-tier, affordable broadband and the equipment and human capital resources to utilize broadband effectively.

The City does not have the staff time or financial resources to achieve this laudable outcome. To prevent stakeholders from developing unrealistic expectations of the outcomes that are possible with available resources, it is important to clarify what the Broadband Master Plan does not seek to accomplish.

**The Broadband Master Plan does NOT outline a plan to provide top-tier broadband access to every individual and organization in the City.**

While it is certainly desirable for all residents and organizations to have access to top tier broadband, the City does not have resources to accomplish this task.

Instead, the Broadband Master Plan outlines strategies to encourage internet service providers to offer faster service at lower prices and to improve stakeholder access to broadband by addressing factors that affect the supply of and demand for broadband.

For example, some strategies attempt to reduce financial and regulatory barriers to providing broadband while other strategies attempt to reduce financial barriers that individuals and groups face accessing broadband.

The City hopes that its efforts to reduce barriers will improve the quality of New Orleans broadband. Better broadband can allow users to perform online tasks faster and save time. The City also hopes to facilitate a decrease in the price of broadband, thereby improving broadband’s affordability, which might increase broadband subscription rates for lower income people.

If even a fraction of the residents and businesses enjoy better broadband and/or lower prices, the City will have progressed toward its goal of improving broadband access.

The longer the City waits to address this issue, the longer New Orleanians will lack access to broadband. Rather than doing nothing or trying to create an ideal situation, access to top tier broadband for everyone, the Broadband Master Plan outlines more achievable goals – improving the quality of available broadband and facilitating access to broadband – and realistic strategies to attain these goals.

## Project Development Process

At the beginning of this process, project staff identified 4 key constituencies, or stakeholder groups, for whom the Broadband Master Plan would develop strategies to improve broadband access.

- Low income residents
- Businesses and non-profit organizations run by or catering to low income individuals
- City departments
- Public safety (first responder) agencies – a subset of City departments<sup>2</sup>

For each constituency, project staff developed questions to understand factors affecting their broadband use, as listed below:

- Whether stakeholders currently use broadband or would like to use broadband in the future
- For non-users, reasons why they do not use broadband
- What tasks broadband users currently complete via internet
- What tasks broadband users would like to complete via internet in the future
- Comfort level using computers, mobile devices, and the internet
- Impact of cost, security, familiarity with technology, etc. on broadband use

Although many questions addressed current broadband use, project staff also encouraged stakeholders to be creative, imaginative, and visionary in thinking about how they may want to use broadband in the short, mid and long term future. In this manner, the outreach process focused on learning what people do and want to do with internet and did not try to limit people's answers to what seemed reasonable in 2013. From the perspective of project staff, stakeholders needed to describe what they want and/or need and project staff would worry about how to achieve that later.

At project initiation in fall 2012, staff focused on both wireline and wireless needs for low-income residents, businesses, and non-profits but only on wireless needs for City departments. Because City departments have access to wireline broadband at City facilities, project staff anticipated that shortcomings in broadband access would be limited to the wireless realm. Therefore, stakeholder engagement focused on learning about department's mobile broadband needs.

Project staff began stakeholder engagement by speaking with City departments first for many reasons, as listed below:

- These stakeholders already use broadband and recognize its value; therefore, project staff could elicit a coherent description of current use and desired future use of broadband, some of which may be applicable to other stakeholders with less exposure to broadband
- Because ITI staff oversees broadband provision to City departments, the City may be able to address their needs more quickly than the general public's needs
- Engaging public sector users first would allow project staff to refine survey questions and techniques with easy to reach stakeholders
- Delaying outreach to low income stakeholders would allow the City to get assistance from experts in community outreach to low income people for broadband issues

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<sup>2</sup> **Note:** In addition to the stakeholders served by the Broadband Master Plan listed above, other stakeholders include staff in the departments charged with implementing the strategies in this document, the community at large, and organizations that offer broadband in New Orleans. Later sections of this document will discuss how the individual strategies of the Broadband Master Plan may impact stakeholders who are not directly served by the Broadband Master Plan.

However, subsequent research into how other cities improved broadband quality and access suggested the City should expand its goals for public sector stakeholders beyond improving wireless access for departments. Therefore, the project staff expanded the scope of the project to encompass improvements to wireline broadband as well.

The information gathered from departments about their mobile broadband needs proved sufficient to develop goals and objectives for improving wireline and wireless broadband for departments. The next section of the report summarizes the information gathered from City departments during the first phase of the stakeholder engagement process and outlines a framework for discussions with low income residents and businesses to learn about their broadband needs when project staff resumes stakeholder engagement.

## **Broadband Needs Outreach – City Departments & Public Safety Agencies**

### **Definition of public sector departments**

Public sector agencies are national, state, multi-state, regional, and municipal governmental entities that provide services to constituents. For developing the Broadband Master Plan, the relevant stakeholder agency is the City of New Orleans government. Project staff engaged individual stakeholders, usually the department head, within their departments and agencies (hereafter departments).

Because the planning process originally focused specifically on the wireless needs of City departments, project staff spoke with representatives of departments whose staff performs a significant portion of work away from the office.

During spring and summer 2013, project staff surveyed departments to gauge the potential to use improved mobile broadband access to drive operational efficiency. The surveyed departments included:

- Public Works
- Historic District Landmarks Council
- Mosquito, Termite, and Rodent Control
- Job1
- Code Enforcement
- Safety and Permits
- Property Management

### **Definition of public safety agencies**

Public safety agencies (commonly called first responders), are a subset of public sector departments that ensure public safety. Like public sector departments in general, these may be national, regional, or local/municipal entities. For the purposes of the Broadband Master Plan, the target stakeholder groups include only City of New Orleans public safety agencies as listed below.

- Homeland Security and Preparedness (NOHSEP)
- New Orleans Fire Department (NOFD)
- New Orleans Police Department (NOPD)
- New Orleans Emergency Medical Services (NOEMS)

Even more so than many other departments, public safety agency staff performs a significant portion of their work away from the office. Furthermore, because first responders often transmit confidential data, they have stringent data security requirements. Consequently, project staff interviewed representatives

from first responder agencies separately to learn about their particular mobile broadband needs, some of which exceed those of other City departments.

Project staff spoke with representatives from NOEMS, NOPD, and NOFD.

### **Outreach Methodology**

Project staff asked department heads about their current and future mobile broadband needs. Depending on the department and its mission, better broadband could help employees to:

- Access files in the office to verify data while working away from the office
- Gather data in the field and upload that data making it accessible to colleagues and/or the public
- Facilitate meetings with constituents in various locations across the City

### **Summary and Implications of Survey Results**

All surveyed departments currently use a variety of tools to manage data and communicate with constituents. Commonly used data management tools include spreadsheets, off-the-shelf databases, and customized software. Commonly used communication tools include phone and email, although a few departments also use social media.

Some departments also use photo, map, and video files regularly. Transmitting these large files reliably requires a laptop or tablet as well as broadband. Departments' increasing need to transmit large files between the office and multiple locations throughout the City will require reliable access to faster broadband in the future. Additionally, representatives of the public safety agencies expressed their absolute need for secure data transmission for sensitive information.

Because many employees lack adequate digital literacy skills, the Broadband Master Plan must address digital literacy as well as physical availability of broadband for City employees. Addressing digital literacy likely will involve connecting employees to digital literacy training and developing easy to learn and use mobile applications to help a workforce with digital literacy challenges utilize mobile technology to improve work performance.

The report, "**Citywide Broadband Master Plan: Survey of City Departments – Response Summary,**" provides more detail on how leaders in City departments and public safety agencies described their current and future broadband needs.

### **Broadband Needs Outreach – Residents, Businesses, & Non-Profits**

Project staff will use their experience with outreach to departments and public safety agencies and the information gathered during that process inform outreach to residents, businesses, and non-profits separately as part of parallel efforts to develop specific strategies to address inadequate broadband access for these stakeholders. The document, "**Outreach Strategy for Residents and Businesses,**" outlines a plan to solicit feedback from these stakeholders.

### **Definition of residents, businesses, and organizations**

The Broadband Master Plan aims to facilitate improved broadband access for New Orleans low income residents and businesses and non-profit organizations that are operated by or serve low income people. To limit certain programs to low income people, government and organizations often administer "means tests." In this case, program sponsors stipulate that beneficiaries' income must be below a certain level; they also may stipulate other requirements beyond income.



Typically, the federal government defines low income as an income less than 80% of the median income for an area. This value varies by family (household) size and across metropolitan areas. In New Orleans, the 2014 calculated median income for a family of four is \$58,800. Therefore, the poverty threshold for a family of four in New Orleans is 80% of \$58,800 or \$47,050. **Appendix A: Definitions** provides detail about methods to define low income and a table with income thresholds for different sized households.

State and local governments and non-profit organizations often follow federal guidelines to administer income-based programs. Therefore, the City could follow federal procedures and avoid creating a new system to determine eligibility for broadband assistance.

Importantly, means tested programs require a significant amount of administrative time to verify that participants qualify. Hence, many organizations avoid means testing. For example, transit agencies offer paratransit service to riders who have difficulty riding buses and trains regardless of income.

Alternatively, the City could target areas where large numbers of low-income people live by offering programs in Census tracts with an average household or per capita income below a certain level. Some people living in the Census tract may have income above the threshold. Because Americans often live in neighborhoods that are stratified by income, it is likely that people who do not meet a means test are only slightly above the threshold. Therefore, it would not be a waste of program resources to help them.

### **Outreach Methodology**

Please see the document, **“Outreach Strategy for Residents and Businesses,”** for information on the outreach plan for residents, businesses, and non-profits.

### **Summary of Survey Results**

Upon completion of outreach to residents, businesses, and non-profits, project staff will update this section of the Broadband Master Plan.

## **Conclusion**

In summation, project staff undertook two years of research to:

- Understand the broadband needs of City staff and City residents, businesses, and non-profits.
- Uncover the many related factors affecting broadband availability, subscription, and use in New Orleans and elsewhere. These factors contribute to the unequal use of broadband by people of different socio-economic levels, the “digital divide.”
- Discover multiple strategies used by other communities to improve the availability and quality of their broadband options, often while reducing the price for users.

Three companion reports, **“Citywide Broadband Master Plan: Survey of City Departments – Response Summary,”** **“Broadband – the World’s Newest Public Utility,”** and **“Broadband Around the World,”** document these findings.

Last, this introduction defined the goal of New Orleans’ Broadband Master Plan – to develop methods to improve broadband access for City staff, and for low-income residents and businesses and non-profits operated by or serving low-income people. This introduction also placed clear limits on the Broadband Master Plan’s goals in that the Plan does not seek to improve broadband access for all New Orleanians. Rather, it concentrates on improving access for the most vulnerable people, the low income, and for City workers so that they can improve their service to all New Orleanians.

The next section describes existing broadband conditions in New Orleans and defines adequate and top tier broadband based on stakeholder input. The following section introduces specific goals, objectives, and strategies to improve broadband access. Subsequent sections discuss individual strategies in more detail. The report presents the strategies in an a la carte fashion; the City can select the strategies that meet its needs.

# Existing Conditions

Previous research defined New Orleans existing broadband environment and compared it to the broadband environment for the metro region, the state of Louisiana, the United States, and some of the United States' international competitors. This research includes:

- A discussion of stakeholders needs and desires in terms of how they want to use broadband
- An overview of current broadband infrastructure and providers
- A description of service gaps in terms of infrastructure deployment, affordability, subscription, and adoption by users
- An examination of the reasons for the inadequate infrastructure deployment, high cost, and uneven adoption rates associated with broadband
- An summary of the ramifications of inadequate broadband access
- A synopsis of actions other communities took to address their broadband shortcomings

For more detailed information about existing broadband conditions in New Orleans, please review the reports, **"Broadband – the World's Newest Public Utility,"** and **"Citywide Broadband Master Plan: Survey of City Departments – Response Summary."**

## Existing Conditions – City Departments and Agencies

The City contracts with Cox for wireline broadband to connect approximately 130 sites on its wide area network (WAN). The WAN connects to the public internet via Level 3 (100 megabytes) and TW Telecom (200 megabytes).

The City uses CISCO equipment to provide wireless local area networks in City facilities. Public safety agencies handle their wireless communications to enable first responders to communicate regardless of their location in the city. Many City buildings offer wireless service to the public after entering a password. As of April 2015, the City spends approximately \$800K per year on data services. The City contracts with AT&T for phone service, which costs approximately \$400K per year as of April 2015.

There are benefits to working with telecoms. First, the City avoids directly paying the cost of network construction. Second, ITI staff avoids responsibility for the minutiae of network administration as this is the telecoms' duty.

But, there are drawbacks to working with telecoms. First, the need for ITI staff to contact telecoms, explain problems, and wait for a reply hinders quick response. Second, the City cannot expand its network to new sites or upgrade service without collaborating with the telecoms which increases the time to accomplish network changes. Third, operations and maintenance costs are greater when contracting with telecoms. While the City may not pay capital costs directly, the telecoms likely embed some capital costs into services fees, which must be sufficient to generate profit.

In the future, the City desires the ability to address problems, upgrade facilities and onboard new sites easily. An institutional fiber network will allow the City to do this without the delay associated with negotiating with telecoms for a lower operations and maintenance price.

## New Orleans Broadband Services to City Departments and Agencies

Existing	Desired Future
<b>Where is broadband available?</b> Wireline – City offices, senior and recreation centers, libraries Wireless – City offices, senior and recreation centers, libraries	<b>Where should broadband be available?</b> Wireline – City offices, senior and recreation centers, libraries Wireless – City offices, more senior and recreation centers, libraries, parks, other locations citywide to support employees working outside the office
<b>Who can access broadband?</b> Wireline – all City employees at the office Wireless – some City employees with mobile devices and/or air cards	<b>Who should be able to access broadband?</b> Wireline – all City employees at the office Wireless – all City employees if wireless access would be beneficial to their job. Depending on circumstances, mobile devices and/or air cards used may be owned by the City or by the employee.
<b>Who is a true broadband adopter?</b> Wireline – many office-based employees are adequate users; however, in some departments, 50% or more of staff lacks digital literacy. Very few departments categorize most/all employees as truly technologically savvy. Wireless – similar to digital literacy skills	<b>Who needs to become a true adopter?</b> Wireline –all employees should develop adequate digital literacy skills, even if only to complete electronic timesheets. Ideally, all employees would become technologically savvy. Wireless –all employees should become adequate in digital literacy to allow greater flexibility in completing work tasks. Ideally, all employees would become technologically savvy. ITI staff could create easy-to-learn-and-use desktop and mobile applications to help employees work more efficiently while improving their digital literacy skills.

### **Existing Conditions – Constituents**

The number of broadband providers varies between the commercial and residential markets. A 2013 web search for New Orleans telecoms revealed approximately 14 ISPs serving the commercial market with wireline and/or wireless broadband. Contrastingly, only seven broadband providers served the residential market with wireline and/or wireless broadband.

Both residential and commercial customers in New Orleans pay too much money for too little service (low bandwidth rates) compared with other cities. The companion reports, “Broadband – the World’s Newest Public Utility” and “Broadband Around the World,” provide specifics on:

- the bandwidth available to New Orleans residents and businesses
- the cost of broadband in New Orleans and in other cities
- the availability of broadband carriers serving New Orleans residential and commercial markets

The low quality and high cost of broadband impact all New Orleanians, but low income constituents suffer disproportionately because this situation often means that they forgo subscribing to broadband at home. A lack of home broadband leaves them dependent on work, school, the library, and community centers to access broadband. Time limits on personal use in these locations hamper the ability to acquire digital literacy skills.

Because the City has limited resources in terms of staff time and money, it is focused on facilitating improved broadband access for low income people, rather than for all New Orleanians.

In the future, the City would like to:

- Entice incumbent telecoms to address problems with their service, upgrade their facilities, and expand their networks to unserved areas of the City
- Persuade new broadband providers to introduce higher quality (greater bandwidth) and lower cost broadband options for the City’s vulnerable low income populations
- Collaborate with other organizations to ensure New Orleans have access to digital literacy training

The City hopes that this will increase the number and quality of broadband options and entice more low income people to subscribe to broadband.

<b>New Orleans Broadband Services to Constituents</b>	
<b>Existing</b>	<b>Desired Future</b>
<p><b>Where is broadband available?</b></p> <p>Wireline – throughout New Orleans</p> <p>Wireless – throughout New Orleans</p>	<p><b>Where should broadband be available?</b></p> <p>Wireline – throughout New Orleans</p> <p>Wireless – throughout New Orleans</p> <p>While it is beneficial that broadband is available in New Orleans, the City wants ISPs to offer greater bandwidth at lower prices. The most obvious means to accomplish this is by increasing competition by increasing the number of broadband providers.</p>
<p><b>Who can access broadband?</b></p> <p>Wireline – Only New Orleanians who can afford it</p> <p>Wireless – Only New Orleanians who can afford it</p>	<p><b>Who should be able to access broadband?</b></p> <p>Wireline – all New Orleanians, regardless of income</p> <p>Wireless – all New Orleanians, regardless of income</p>
<p><b>Who is a true broadband adopter?</b></p> <p>Wireline – Like the United States as a whole, in New Orleans, higher income people typically have more formal education and are more likely to have access to broadband at home, contributing to their greater ability to develop true digital fluency compared with counterparts with less money.</p> <p>Wireless – While higher income people use mobile devices, many low income people use mobile devices instead of desktop devices and have fluency with these devices. However, other lower income people can perform only the most basic tasks with mobile devices, which puts them at a severe disadvantage compared with people who can perform many desktop functions on a mobile device and people with digital literacy skills for desktop devices, too.</p>	<p><b>Who needs to become a true adopter?</b></p> <p>Wireline –all New Orleanians</p> <p>Wireless –all New Orleanians</p> <p>ITI staff can connect New Orleanians to existing and future digital literacy education programs to help New Orleanians develop vital digital literacy skills.</p>

# Defining Broadband Goals

Any network must meet the needs of two constituencies – network users and network owners and managers i.e.) the people who will plan, operate, and maintain the network. Network users and network owners and managers often have different perspectives.

For example, users consider network performance attributes that directly affect user experience (e.g. download and upload speeds, data limits, reliability) and price to evaluate current and potential broadband service providers. While network managers care about these network performance attributes because they influence the attractiveness of the network to potential users (and the price users will pay for service on networks that sell service rather than serving internal users), network operators also care about many other factors.

Besides the parameters discussed above, network managers consider granular network performance attributes, such as the bandwidth transmission rates underlying download and upload speeds, the details of network maintenance, and the ease with which the network can be expanded to meet increasing demand. Most users remain unaware of these other factors that also impact the user experience. Network managers, however, must consider such factors and the cost of providing service.

Prior to construction, the network owner (who often becomes the network manager) will consider a range of factors to determine which type of network to build. These include:

- Initial capital costs and the capital cost of possible future expansions
- The resilience of various technologies and network designs
- Future operating and maintenance costs
- Likely subscription rates (if applicable)
- Prices that can be charged to users (if applicable)
- The price and quality of competing networks
- Multiple other factors for various types of networks

In summation, network owners and managers care about the same parameters as users and other factors related to network construction and administration. On the other hand, only a small number of users care about network construction and administration. Most users limit their evaluation to parameters that obviously affect their use of broadband and the price they pay for broadband.

To define adequate and top-tier broadband for a proposed institutional network, near term pilot projects to serve low income people, and for the City at large, project staff considered factors like:

- The perspectives of users, owners, and managers as described above
- The expected short-term and long-term evolution in user needs and available technologies
- The need to ensure that future networks support the City's broad aspirations like equity, economic development, and resilience in addition to fostering better service for City departments and agencies and the low income constituents

Conversations with broadband experts suggested that the City emulate the broadband requirements of academia or those recommended by industry standards committees. In the past, the technology used in academia often filtered to the public in 6 to 8 years. More recently, due to shorter technology cycles, top tier technology is available to the public in only 4 years. Project staff considered these trends when developing criteria to define adequate and top tier broadband.

An adequate network is one that meets the stakeholder needs at the time of construction and will continue to meet those needs for a specific number of years afterwards. It would be able to handle current applications and number of users and expected increases in the number of users in the future. An adequate network could offer either synchronous or asynchronous bandwidth similar to that offered in other cities.

On the other hand, a top tier network could offer synchronous upload and download speeds exceeding those available anywhere else in the world in the hopes of accommodating applications that have not been invented and today's internet traffic.

The table below outlines criteria for both adequate and a top tier solutions to meet the needs of stakeholders. Project staff developed these parameters based upon feedback from stakeholders obtained during the outreach process described previously. As the project develops, project staff will re-engage with stakeholders periodically to refine their understanding of stakeholder needs and then translate user needs and network manager needs into technical specifications for the network.

The sections that follow provide more detail on the requirements for adequate and top tier solutions for each of the 3 stakeholder groups.



	Adequate Broadband	Top Tier Broadband
<b>Institutional Network to help City departments in their mission of serving the public</b>		
Main Goals	<p>Improve City's ability to gather &amp; share information and conduct transactions in service to constituents</p> <p>Support increased use of mobile devices for City employees who perform work away from the office</p> <p>Support efforts to improve infrastructure, technology, environmental, community and water management resilience</p> <p>Support efforts to improve public safety</p> <p>Improve City control over telecommunications</p> <p>Increase flexibility in providing telecommunications services to City departments</p>	<p>Improve City's ability to gather &amp; share information and conduct transactions in service to constituents</p> <p>Support increased use of mobile devices for City employees who perform work away from the office</p> <p>Support efforts to improve infrastructure, technology, environmental, community and water management resilience</p> <p>Support efforts to improve public safety</p> <p>Improve City control over telecommunications</p> <p>Increase flexibility in providing telecommunications services to City departments</p>
Constituents	<p>All City departments – users</p> <p>Specific ITI, DPW, and/or SWB staff – network owner/managers</p>	<p>All City departments – users</p> <p>Specific ITI, DPW, and/or SWB staff – network owner/managers</p>
Technology	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives
Bandwidth	<p>Based on the tasks departments would like to perform now and in the future.</p> <p><b>In Network</b></p> <p>Wireline: 1 Gbps upload / download</p> <p>Wireless: 1 Gbps upload / download</p> <p><b>Connection to World Wide Web</b></p> <p>10 gbps</p>	<p>Based on the tasks departments would like to perform now and in the future and the need to anticipate future technology innovations.</p> <p><b>In Network</b></p> <p>Wireline: 1 Tbps upload / download</p> <p>Wireless: 40 Gbps upload / download</p> <p><b>Connection to World Wide Web</b></p> <p>1 tbps</p>

	<b>Adequate Broadband</b>	<b>Top Tier Broadband</b>
<b>Pilot Projects to improve service for low income residents &amp; businesses</b>		
Main Goals	Provide broadband access to low income people at: <ol style="list-style-type: none"> <li>1. community anchors in their neighborhoods</li> </ol> Educate people on broadband's value and how to use broadband to perform critical life tasks	Provide broadband access to low income people at: <ol style="list-style-type: none"> <li>1. community anchors in their neighborhoods</li> <li>2. their homes and businesses</li> </ol> Educate people on broadband's value and how to use broadband to perform critical life tasks
Constituents	Low income residents and businesses – users  Private and non-profit ISPs – network owner/managers	Low income residents and businesses – users  Private and non-profit ISPs – network owner/managers
Technology	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives
Bandwidth	Wireline: 1 Gbps upload / download  Wireless: 1 Gbps upload / download	Wireline: 1 Tbps upload / download  Wireless: 40 Gbps upload / download

	Adequate Broadband	Top Tier Broadband
<b>Policy changes to entice telecoms to improve the quality and price of broadband for the public</b>		
Main Goals	<p>Increase the bandwidth and decrease the price of New Orleans broadband options eliminating differences broadband quality between New Orleans and US cities with the best broadband</p> <p>Support increased use of home and mobile broadband, eliminating difference in subscription rates between New Orleans and US cities with the highest broadband subscription rates</p>	<p>Increase the bandwidth and decrease the price of New Orleans broadband options eliminating differences in broadband quality between New Orleans and foreign cities with the best broadband</p> <p>Support increased use of home and mobile broadband, eliminating difference in subscription rates between New Orleans and foreign cities with the highest broadband subscription rates</p>
Constituents	<p>New Orleans residents, businesses, and non-profit organizations - users</p> <p>Private and non-profit ISPs – network owner/managers</p>	<p>New Orleans residents, businesses, and non-profit organizations - users</p> <p>Private and non-profit ISPs – network owner/managers</p>
Technology	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives	Any technology that will accomplish bandwidth, flexibility, reliability, security, and other objectives
Bandwidth	<p>Wireline: 1 Gbps upload / download</p> <p>Wireless: 1 Gbps upload / download</p>	<p>Wireline: 1 Tbps upload / download</p> <p>Wireless: 40 Gbps upload / download</p>

# Broadband Objectives

The City defined the Broadband Master Plan's overarching goal as facilitating the availability of broadband to New Orleans' residents, businesses, non-profits, and government workers. Project staff gathered data from department heads about their needs as users and additional data about other cities' broadband networks to define "adequate" and "top tier" broadband as described in the previous section. These sources include:

- Research into bandwidth availability and pricing in other cities in the United States and worldwide as documented in the report, "Broadband Around the World"
- Research to determine tasks that people typically perform via the internet to determine minimum bandwidth for residents, businesses, and City departments and public safety agencies
- Discussions with residents and businesses to learn how they want to use broadband
- Conversations with managers in City departments and public safety agencies to determine their current and future broadband needs, with a special emphasis on mobile broadband to enhance employee productivity when working away from the office
- Discussions with ITI staff to determine what bandwidth the City should pursue to meet the needs of its internal clients and constituents

Based on the experience of other cities as documented in the report, **"Broadband Around the World,"** project staff learned different methods the City could use to improve broadband access and subscription. Project staff used knowledge of stakeholders' broadband needs, bandwidth and pricing available in other cities, and strategies used by other cities to provide such bandwidth and pricing to create strategies to improve the availability of high-speed broadband for each stakeholder group.

According to the California Emerging Technology Fund, local and regional governments play many leadership roles with respect to broadband, including: policy leader, planner, regulator (especially land use), consumer, and service provider.<sup>3</sup>

- As policy leaders, local and regional governments create policies and ordinances to protect the public interest as expressed by constituents. They also implement state and federal laws, thereby determining if a jurisdiction welcomes and facilitates investment in broadband.<sup>4</sup>
- As regulators, local and regional governments study and approve land uses and are in a pivotal position to require "smart" infrastructure and facilities as they approve land use projects.<sup>5</sup>
- As planners, local and regional governments prepare land use and other plans to guide development, thus determining how "smart" growth will be and defining future quality of life.<sup>6</sup>

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<sup>3</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

<sup>4</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

<sup>5</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

<sup>6</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

- As consumers, local and regional governments purchase technology which drives demand for broadband technology and services.<sup>7</sup>
- As service providers, local and regional governments decide if government integrates broadband into its functions and provides information and services online, encouraging broadband use.<sup>8</sup>

The resulting New Orleans Broadband Master Plan seeks to satisfy 4 main objectives via a suite of strategies aimed at influencing the deployment and adoption of broadband. These strategies take advantage of the leadership roles a municipality plays with respect to broadband as outlined above. For each objective, the Broadband Master Plan includes multiple strategies. The strategies include public policy tools, information and adoption programs, and/or infrastructure investment. The text below provides an overview of each objective. Subsequent sections discuss the strategies.

#### **Objective 1: Improve Broadband Access for City Departments and Public Safety Agencies**

- **Challenge:** Department heads would like to increase the use of mobile devices and mobile applications in instances when their use would improve staff efficiency and effectiveness, thereby allowing City workers to provide better service to constituents. Strategies to address this problem focus on improving the quality of wireline and wireless networks used by City of New Orleans staff and working with City departments to achieve their goals for using mobile devices to improve productivity and service.

#### **Objective 2: Facilitate Broadband Access for Low Income Residents, Businesses, and Non-profits**

- **Challenge:** Many low income New Orleanians lack internet access. Strategies to address this issue focus on reducing their specific barriers to access – namely, the unaffordability of broadband and a lack of digital literacy among some New Orleanians.

#### **Objective 3: Improve Bandwidth Options and Pricing for Residents, Businesses, and Non-profits**

- **Challenge:** In the New Orleans duopoly broadband market, ISPs charge high prices for lower quality service than that available in many other cities. The high prices limit broadband access among low income people. The low bandwidth limits what New Orleanians who do subscribe can accomplish with their broadband. Strategies to address this challenge focus on developing policies to incent ISPs to develop affordable, high-quality bandwidth for low income people and to increase the bandwidth and reduce the price of service available in New Orleans in general.

#### **Objective 4: Promote Benefits of Digital Technology**

- **Challenge:** Many people don't know how to use digital technology to perform personal and professional tasks, which presents the City with an opportunity to show them the various ways that using broadband internet for certain tasks can make their lives easier. Strategies to address this issue focus on showcasing the capabilities of broadband and training constituents how to use broadband.

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<sup>7</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

<sup>8</sup> "Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 9.

## Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience

- **Challenge:** Like many municipalities, the City faces challenges with regards to equity, economic development, and resilience. For example, in the United States, compared to peers with more money, low income people are less likely to:
  - Use the internet
  - Have the technology skills to use the internet
  - Graduate from high school
  - Start college
  - Complete college
  - Obtain well-paying jobs

Compared to peers with more money, low income U.S. residents are more likely to:

- Live in communities with environmental challenges such as air, water, and soil pollution
- Suffer from asthma

This incomplete list of disparate educational, economic, and health outcomes illustrates the tremendous challenge of achieving equity for disadvantaged people.

Broadband is a tool the City can use to promote equity, economic development and resilience. For example, reducing the digital divide helps:

- Low income people access knowledge and skills to improve high school and college graduation rates, thus tackling the equity issue
- Attract new businesses and provide job opportunities for existing residents thereby supporting economic development
- Support the deployment of environmental sensors that share data on soil moisture, flooding, air quality, etc. allowing public safety officials to predict and plan for events, thereby improving resilience for individual New Orleanians and for New Orleans overall.

## Measuring Progress in Meeting Objectives

The City will need to evaluate the success of its strategies in satisfying the Broadband Master Plan objectives outlined above. Project staff and stakeholders involved in project oversight should develop performance measures to assess each strategy's efficacy in meeting its stated purpose. These performance measures should be SMART (specific, measurable, assignable, realistic, and timebound).

For example, possible performance measures to gauge an increase in the work-related digital literacy skills of employees, employee use of digital technology for work, and overall employee comfort in using digital technology for work-related tasks could include:

- Within a department, the percent increase in the number of employees with minimal digital literacy skills as measured by the ability to perform a pre-determined set of work tasks using a desktop and/or mobile device and related applications without assistance or prompting
- Within a department, the percent increase in the number of employees that use desktop and/or mobile devices and related applications instead of paper or manual procedures for work tasks
- For each employee within a department, the percent increase in the share of work tasks completed using desktop and/or mobile device and related applications instead of paper or manual procedures for work tasks

- Percent of employees who feel that their skill-level using desktop and mobile devices and applications to perform work has improved significantly

For the goal of improving broadband access for low income individuals, performance measures could include:

- Number of public housing sites with free internet access in public spaces
- Number or Percent of public housing residents with affordable broadband in their homes
- Number of digital literacy training hours provided

For the goal of deploying a citywide institutional fiber network to improve ITI control over the city's telecommunications services, one output measured could be:

- Number or percent of City facilities connected to the institutional fiber network

When developing performance measures, it is important to remember the distinction between outputs, which will measure effort by the City and/or its partners in trying to effect a change and outcomes, which evaluate beneficial changes for targeted people.

For example, the number of hours of digital literacy training offered or the number of people trained are outputs. The number of people who improve broadband skills to the point that they can perform key life tasks would be an outcome of the multiple hours of digital literacy training.

When developing performance measures, project staff and stakeholders must remember that the measures of success for the public sector should be different than the measures of success for a private firm because the goal is serving constituents not making a profit.

Thus, staff should limit performance measures to those appropriate to the public sector. "It is inappropriate to use conventional Wall Street metrics to judge the success of a municipal project. Indeed, many municipal broadband projects are undertaken because the Wall Street metric does not work."<sup>9</sup>

## **Summation**

The remainder of this report discusses strategies that the City can implement to achieve these objectives. For the sake of brevity, the report introduces strategies within the body of this document and relegates detailed information to appendices at the end of the document.

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<sup>9</sup> Jim Baller and Casey Lide, "The Case for Public Fiber-to-the-User Systems," March 4, 2006, pg. 15.

# Strategy 1: Build Institutional Fiber Network

**Challenge:** Department heads would like to increase the use of mobile devices and mobile applications in instances when their use would improve staff efficiency and effectiveness and thereby allow City workers to provide better service to constituents.

As mentioned previously, the Broadband Master Plan proposes that the City build an institutional fiber network to serve City owned and operated buildings and facilities (sites). This strategy directly supports **Objective 1: Improve Broadband Access for City Departments and Public Safety Agencies**. The City deems improved broadband access for City departments and public safety agencies important because it will enable City employees to increase their use of broadband to enhance their productivity and provide new ways to interact with constituents. Because the City could provide broadband access and digital literacy education to the public at publicly accessible City owned sites like parks and community centers, this strategy also can support **Objective 2: Facilitate Broadband Access for Low Income Residents, Businesses, and Non-profits** and **Objective 4: Promote Benefits of Digital Technology**. Because the City can use an institutional fiber network to support the deployment of environmental sensors, an institutional network also supports **Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience**.

The City would own the network. ITI would manage the network, either directly with City employees or indirectly via a consultant, depending on the City's needs and the availability of human and financial resources. Based on the current and future needs of users, the City should aim to build a 1 terabit per second network, which would allow ITI to improve wireline and wireless services for City employees.

When evaluating options to improve broadband access for City employees, the City compared the amount of effort to implement each strategy with the potential benefits of the strategy. Implementing an institutional network would require a significant effort by the City in direct financial costs, staff effort, and technical, political, and other challenges. For example, the City would have to spend a significant sum of money on capital costs; ITI department staff would have supervise consultants responsible for buildings and maintaining the network, in addition to their current duties.

However, the City also stands to reap significant benefits from having an institutional network in terms of improved network efficiency, increased control of its network, and decreased operations costs. The next sections highlight potential benefits, costs, and challenges the City would face if it built an institutional network.

## Benefits

### Increased Control and Improved Network Efficiency

An institutional network offers the City major operational benefits - increased control over its telecommunications services, which can lead to improved network efficiency.

For example, because the City would own and operate the infrastructure, ITI could increase bandwidth more quickly in response to demand from City departments and agencies. Likewise, ITI could onboard new sites quickly to ensure that City sites always have sufficient wireline and wireless broadband.

Third, because wireless networks ultimately depend upon wireline networks, the promulgation of wireline broadband would improve ITI's ability to support departments in their use of wireless technology to improve staff efficiency and effectiveness away from the office.



Contrastingly, under the current scenario, the City must call its internet service provider, Cox, to request more bandwidth or any other changes it needs. If Cox is unresponsive, the City must wait. Therefore, the flexibility offered by a City owned network would make it easier for ITI to ensure top tier wireline and wireless broadband for departments to use to serve constituents.

## **Operations Cost Savings on Telecommunications Services**

Building an institutional fiber network could help the City reduce the money it spends on telecommunications services due to decreased operations costs. Although the City initially would spend money to build a network, the potential savings in operations costs during later years could offset construction costs, especially if the City can secure funding from other entities to pay for much of the construction costs as contemplated in **Appendix D: Grant Funding Sources** and **Appendix E: Other Funding Sources**.

Many cities experienced significant savings in telecommunications operations costs after building an institutional network. The report, “**Broadband Around the World,**” profiles cities that saved money on telecom operations costs thanks to institutional fiber networks, including Santa Monica, CA, Bristol, VA, and Tacoma, WA. This cost reduction arises when a city no longer pays ISPs for broadband service.

Based on the amount of money the City spent on telecommunications services in 2013 and the estimated amount of money the City will spend in 2014, it is likely that the City ultimately could save approximately \$1M annually in operations costs by building an institutional fiber network. The amount of savings will vary based on the difference between the prices charged by the telecoms and the costs incurred in operating an institutional network.

### **Limitations**

Because the City cannot function without internet access, it would have to continue paying its private sector telecom providers for service while it constructs its network. Therefore, the construction of an institutional network would result in a short-term increase in operations costs. However, over the long-term, the City should save money by building and operating its own network.

## **Technical and Political Challenges**

To build and manage the proposed institutional network, project staff will face multiple technical and political considerations, some of which are described below.

### **Determine the Level of Service to Provide**

Before designing an institutional network, project staff must converse with users in various departments to understand how they employ broadband now and how they would like to apply it in the future. As previously mentioned, project staff already spoke with department heads. Project staff also should consider speaking with people served by City departments to learn how the public wants to interact with that department via internet.

Additionally, project staff will need more discussions with ITI staff that would be tasked with network operations to determine their needs and preferences as network managers.

One desired outcome of these conversations will be that project staff will understand the difference between items that stakeholders must have and items that stakeholders merely desire. Project staff will use the information from these discussions to create technical requirements for the network that provide at least an adequate level of service as discussed previously.

## Determine the Network's Geographic Extent

Based on discussions with stakeholders, project staff also will need to select which locations to serve if the City does not intend to serve every City owned facility. If the City opts to provide broadband service to all its facilities, given the far flung nature of City sites and the need to pace construction to funding availability, the City may not be able to build the entire network immediately. If the City phases its construction, the City would have to determine the order in which different locations receive service.

## Construction Challenges

The construction of a fiber network would involve laying fiber either in a conduit buried in the ground (either earth or pavement) or stringing aerial fiber above ground between attachment sites like utility poles, towers, and buildings. Challenges with in-ground construction include:

- Need to dig or bore a conduit to hold the fiber, which can be time-consuming and expensive
- Need to accommodate future land subsidence when laying the fiber

Challenges with aerial construction include:

- Need to find structures to which fiber can be attached, which can be time-consuming and expensive
- Need to string fiber to minimize risks associated with high-wind events

## Data Availability Challenges

Currently, the City does not have a complete geo-database of its fiber assets (conduits, fiber) or of fiber owned by other entities. In addition to telecommunications infrastructure, the City also will need geospatial information about its utilities (e.g. water, waste water, storm water, and electricity) and City owned property, including buildings, land, poles, and rights-of-way. **Appendix H: Public Policy Recommendations** discusses policies the City could adopt to facilitate the collection and organization of the required data in an easily accessible format.

## Identify and Obtain Resources to Build and Manage a Fiber Network

Beyond the financial resources mentioned previously, the City must determine the human resources (staffing levels and specific expertise) to execute this project. Because current staff is busy keeping the City's network and other systems operational, they may not have time to direct their attention to planning a City owned network. Furthermore, the current staff may not have all the necessary expertise to design and build a fiber network.

If the City determines that it needs more staff or staff with different skill sets, it could hire new staff or consultants to work with the ITI department. One of the City's advantages is its staff's willingness to be thoughtful about efforts to improve broadband. This allows City staff to take time to talk to stakeholders and vet options to ensure that its solutions meet the stated project objectives.

## Select the Business Model to Perform Network Operations

The City would have to determine its preferred business model. More specifically, the ITI department, which would oversee network operations, must decide which tasks associated with daily network operations to perform itself, and which tasks, if any, to delegate to a consultant.

ITI staff could hire consultants to handle daily operations for 5 to 10 years and learn the minutiae of running a fiber network. Once the vendor's contract expires, ITI staff could assume responsibility for

daily operations. Alternatively, the City could decide that it prefers to pay others to handle details to allow its staff to focus on overall management.

## Political Considerations

Municipalities that build publicly owned and operated networks often face opposition from incumbent telecommunications providers, especially if the municipal network serves residents and businesses. Frequently, telecoms launch a public relations campaign to try to convince residents and business owners that a publicly owned network is a terrible idea. ISPs often claim that:

- The municipality can't afford to build the network
- The municipality does not have the expertise to build and operate a network
- The municipality's residents and businesses don't need faster, more affordable internet
- The very idea of a municipality providing broadband to its citizens is suspect

In addition, ISPs often lobby state legislators to pass laws that either:

- Prohibit municipalities from building publicly owned broadband networks or
- Place restrictions on municipally owned networks to make it more difficult for municipalities to build and operate networks compared to similarly situated private ISPs. In such instances, municipal officials often must defend themselves against comments in the media from ISPs, their allies in ISP run "citizen" activist groups, and state level politicians.

The companion reports, **"Broadband: the World's Newest Public Utility"** and **"Broadband Around the World,"** detail tactics typically used by ISPs to maintain the monopoly or duopoly status that enables them to charge high prices for subpar services.

Because the City does not plan to offer service to residences and businesses, the City will not be competing with New Orleans incumbent ISPs for customers. Therefore, from the perspective of the people managing local ISPs, the initiation of a City owned and operated network represents the loss of one large customer rather than the loss of one large customer and thousands of smaller customers.

Local ISPs will be displeased to learn that the City may build a fiber network. ISPs might mount an opposition campaign. However, their opposition may be less strident because the City does not intend to serve the public directly with its proposed fiber network.

On the other hand, the City is fortunate that it does not need approval from state or federal regulatory agencies to implement an institutional fiber network unlike public-serving networks, which are regulated by the FCC and its state-level counterparts.

## Costs and Risks

In addition to possible benefits, building and operating an institutional network involves potential costs and risks. This section discusses costs and risks and potential methods to counteract these.

### Capital Costs

The largest cost associated with building an institutional fiber network is the cost of network construction. Telecommunications systems like the proposed fiber network are complex infrastructure systems. New Orleans' proposed network would connect one hundred or more sites across a 350-square mile city. Without a network design, one can estimate that the cost of an institutional fiber network for the City of New Orleans likely would be tens of millions of dollars if not more.

Many municipalities that built institutional networks borrowed some money to pay for network construction. However, the City of Santa Monica, CA built a network without borrowing money. Given scarce resources available, the City of New Orleans should strive to develop a plan that helps the City build its network without borrowing large sums of money.

Most fiber networks employ both underground and aerial fiber installation; each technique has benefits and drawbacks. For example, in-ground fiber networks typically involve relatively high installation costs due to the expense associated with digging or boring tunnels to house the conduit that holds the fiber. However, because the fiber is protected, maintenance costs may be minimal.

On the other hand, aerial fiber installation typically costs less than in-ground fiber installation, despite the fact that network owners typically must negotiate agreements to mount their equipment on buildings and structures owned by other entities. However, maintenance costs for aerial fiber are greater because the fiber is more exposed to potential damage.

Like any entity constructing a telecommunications network, the City will have to balance the benefits and drawbacks of underground fiber installation with the benefits and drawbacks of aerial fiber installation when designing and building its proposed fiber network.

## **Reputational Risk**

Another risk associated with an institutional network is possible negative publicity if the project “fails” in some manner. Failure might stem from construction delays, problems getting the technology to work, or challenges managing the completed network.

However, a municipality faces similar reputational risk when purchasing telecommunications (or any) products or services from a private sector vendor. The public can levy criticism at a municipality for choosing a seemingly inept vendor who was unable to provide adequate telecom services as it can for failure to provide adequate telecom services in-house.

Reputational risk exists no matter what action a municipality takes. Therefore, decision makers should focus on all risks together and methods to mitigate those risks rather than focusing an inordinate amount of attention on perceived reputational risk.

## **Reducing Costs and Risks**

There are several actions a municipality can take to reduce its cost in building an institutional network, the need to borrow to pay for capital costs, and reputational risk.

### **Reducing Capital Costs**

The City may be able to reduce the cost to build a fiber network by taking advantage of other projects or sharing construction costs with the private sector.

Because the main cost of fiber installation is digging the trench to house the fiber, using trenches dug for other projects and utilizing newer fiber deployment techniques like micro-trenching could reduce construction cost significantly. “Dig Once” policies help municipalities leverage street rehabilitation and sewer repair projects by allowing or requiring fiber or conduit installation when streets are opened for other projects.

Ideally, the City can take advantage of its Sewerage and Water Board’s \$500 million, 10-year project to evaluate and rehabilitate the sewer system. The repair and/or replacement of waste water infrastructure will require construction crews to dig in many City streets. The ITI department should take

advantage of in-street trenches to install in-ground fiber conduit. See <http://www.gosserp.com/> for more information about the Sewerage and Water Board's ongoing multi-year capital program.

The City also could take advantage of its role as a purchaser of services, the owner of land and buildings where telecoms may want to install infrastructure, or as the approver of permits to negotiate agreements with the telecom providers that allow the telecoms to share the cost of building the proposed fiber network. For example, telecoms upgrading their networks could install extra fiber for City use. The City could reduce or waive permit fees in exchange for the fiber.

Utilizing such measures would require the City to write policies outlining the circumstances under which such agreements would be acceptable, the types of products and services affected by the policies, the types of products and services the City would like to acquire, and what the City could provide in return. The City also would have to develop procedures to enforce agreements to reduce permit fees in exchange for infrastructure. **Appendix H: Public Policy Recommendations** contains more detail about potential cost reduction techniques.

**Reducing the Need to Borrow** – Municipalities can reduce the need to borrow funds for capital costs by building the network gradually during a multi-year period. This strategy could allow municipalities to use operating cost savings from earlier project phases to pay for subsequent construction. Santa Monica, CA used this strategy to avoid borrowing money. See the report, **"Broadband Around the World"** for a summary of Santa Monica's experience building an institutional fiber network. However, this approach may increase the construction period which could offset the benefit of avoiding debt.

## Reducing Reputational Risk

The City can take steps to reduce the risk of failure. For example, the City can hire experts in fiber network construction and operations and maintenance to oversee those tasks initially. The City also could introduce an institutional fiber network gradually while it still has a contract for broadband service with ISPs. This overlap in service providers would allow the City time to address any malfunctions onboarding departments before transitioning from the old network.

In recent years, City staff has communicated the need for an asset management system to elected officials through budget requests. Asset management systems allow asset owners to track the location, condition, and other pertinent details of city owned items. Ideally, asset tracking should be tied to a work-order system that tracks maintenance of assets. The use of such systems helps asset owners maintain assets in workable condition until the projected end of the assets' useful life, thereby saving money.

If the City implements asset management, it should apply asset management to the equipment in its fiber network just as it would to other City assets like sewer systems, traffic lights, street lights, buildings, parks, vehicles, etc.

## Paying for Network Construction: Funding Sources

The City would need money to pay for network construction. This money could come from many sources, including City revenue, grants from outside entities, and/or debt.

To a certain extent, City revenue is the least restrictive option. Avoiding funders, creditors, and partners would allow the City to reduce the risk of outside interference in decisions about network type and/or operations or construction terms. However, the use of City revenue is the most restrictive option in the sense that revenue used for a broadband network would be unavailable to pay for other City priorities.

A second option, outside grants, would allow the City to avoid tradeoffs in the use of its revenue. However, restrictions on the use of grant money may make certain grants infeasible for the City. Project staff will need to vet grant opportunities to determine how useful these are. **Appendix D: Grant Funding Sources** and **Appendix E: Other Funding Sources** list ideas for acquiring money to pay for broadband network construction.

A third option is debt financing, which may include direct loans from banks or the issuance of bonds. In many ways, debt is the least attractive option because debt involves interest, which increases costs beyond the amount borrowed, as well as possible restrictions that creditors may try to impose on network construction, design, and/or operations.

Whether the City pursues grant and/or debt funding is subject to the preferences of the administration and the City Council at the time that the City decides to construct a network. Regardless of whether the City obtains grants and/or borrows money to pay for network construction, it is almost certain that the City would have to allocate money to pay for some network construction costs.

In addition to allocating City funds, obtaining grants or borrowing money, the City also may be able to generate revenue to finance network construction as listed below.

- Permit and/or franchise fees from telecoms that install infrastructure on City owned property such as buildings, poles, or ROW
- Fees from sustainable infrastructure demonstration projects citywide as contemplated by the RE.invest initiative, which is described in **Appendix E: Other Funding Sources**
- Use of operating cost savings from reduced telecom costs as ITI transfers telecom services from ISPs to its institutional network to pay for subsequent network expansion

## Paying for Network Construction: Funding Mechanisms

The City could establish a designated fund or other type of contribution account to isolate money to pay for building an institutional fiber network from so this money is not spent on other priorities. Ideally, the City would seed the fund with money to start network construction and use savings from decreased operations costs to pay for network expansion as Santa Monica, CA did.

Conversations with the Law department and staff in departments that use designated funds to pay for specific projects and programs indicate that the City has two vehicles for designating funds for a specific use: proprietary funds and enterprise funds.

**Enterprise Fund:** An enterprise fund is an account designed for entities that operate as self-supporting businesses. Projects and programs that are the beneficiaries of enterprise funds typically do not receive financial support from the City's general fund. Louisiana legislation specifically allows municipalities to establish a "communications services enterprise fund" to account for local government operation of cable television, telecommunications, or advanced services.<sup>10</sup>

While enterprise funds do not require state approval, these accounts do require administrative and City Council approval. An example of a City entity that uses an enterprise fund is the French Market Corporation.

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<sup>10</sup> Louisiana RS 45:844.51 <https://legis.la.gov/legis/Law.aspx?p=y&d=285535> (accessed May 26, 2015).

**Proprietary Fund:** A proprietary fund (also known as a “237 account”) is an account designed for entities that do not operate as self-supporting businesses. Money in a proprietary fund typically can be spent only by a specific department on specific projects that the account supports. While it is possible for the City to re-capture money in a proprietary fund and shift that money to the general fund or to another account to pay for other priorities, it would be very unusual for the City to do so. Projects and programs with a proprietary fund remain eligible for financial support from the City’s general fund.

Several City departments and agencies, including public safety departments, various courts, and the Mosquito, Termite and Rodent Control Board, have used proprietary funds to set aside money for specific purposes. For more information, please contact:

- City of New Orleans Law Department
- Chief Accountant – Lolita Isom
- Controller – Roy Guercio

However, it is unclear if/how the City could use enterprise or proprietary funds to allocate City money to pay to build a fiber network. The City charter says that all funds which are used for “defraying any operating expense” are general funds, and that other funds may only be created “as are required to comply with the provisions of any law, contract or donation under which the City receives moneys or to comply with generally accepted accounting principles.” (Charter, 6-201.)

However, if this fund is considered a type of fund other than an operating fund, then “The Mayor, with the approval of the Council, may establish other funds when necessary and when no appropriate class of funds exists in accordance with generally accepted accounting principles, and the Director of Finance may create funds required to comply with generally accepted accounting principles.” (Charter, 6-207.)

## Partnerships

To build a successful institutional network, ITI must collaborate with the City departments that it serves to ensure that it designs and builds a network that can serve those department’s needs. In addition, the City will have to coordinate with staff in the Property Management department to determine how to bring fiber service to existing City buildings as well as any buildings to be built in the future.

ITI also could collaborate with the City’s outside agencies, other local government entities like surrounding parishes, and regional, state, and federal agencies that provide services and/or have a physical location in New Orleans. Depending on the business model it pursues, the City could consider partnerships with private and non-profit organizations as well.

Collaboration has many possible benefits. Project partners could defray the cost of building and operating a network via direct money contributions or use of their facilities to host network infrastructure. Project partners with telecom expertise could share knowledge. Partnerships also may help a City owned network serve more people, thereby spreading its benefits more broadly.

The City should develop a list of broadband related projects on which it would be willing to work with partners. If the City develops this list beforehand, staff will not have to waste time determining how potential partners can help. The “wish list” should include items and services that can be donated at different price points so the City can benefit from generosity of a range of people and organizations.

**Appendix C: Partnerships** lists organizations that could be partners in an institutional fiber network. All lists are non-exhaustive. Because the City is in the earliest stages of planning its institutional network, it does not have formal agreements with potential partners yet.

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## Strategy 2: Allow ISPs to Serve Public Via Institutional Network

Once the institutional network is built, the City could allow New Orleans ISPs to offer wireline and wireless broadband via the institutional network on a competitive basis. The City would need to adopt and enforce standards to ensure that private sector use of the publicly owned network provides sufficient benefits to the public.<sup>11</sup> For example, the City could set parameters for bandwidth and price to ensure that the ISPs are providing affordable, high-speed service via the institutional network. Incumbent telecoms would benefit from being able to offer higher bandwidth service with greater data limits, which could attract new customers, and New Orleans residents and businesses would benefit from the enhanced options available at reasonable prices.

This strategy supports **Objective 3: Improve Bandwidth Options and Pricing for Residents, Businesses, and Non-profits**. This strategy also could support **Objective 2: Facilitate Broadband Access for Low Income Residents, Businesses, and Non-profits** and **Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience**.

Other communities allow ISPs to serve customers on municipally owned networks. For example, in Utah, several municipalities built the UTOPIA network and contracted with ISPs to provide service to residents and businesses. In Santa Monica, two incumbent ISPs eventually opted to use the municipal network to serve customers. For more information about how these communities allow ISPs to serve residents and businesses via a publicly owned network, see the companion report, **“Broadband Around the World.”**

To reiterate, municipalities must negotiate some parameters of service with ISPs ensure that ISP use of a municipally owned network to benefits community members. For example, municipalities could negotiate for ISPs to offer greater bandwidth levels and data limits than what is currently available in the community. Municipalities also could negotiate with ISPs to create an affordable, high bandwidth plan for low income people.

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<sup>11</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 19.

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# Strategy 3: Digital Literacy Training and Mobile Application Development for City Employees

**Challenge:** Because some City employees lack digital literacy skills, they cannot use web-based applications to do their jobs better i.e.) faster, more accurately, and/or more efficiently or to facilitate communication with constituents. Without assistance, these individuals are likely to remain under skilled at using such applications and the internet in general.

To derive the most benefit from its proposed institutional network, the City needs to maximize the number of employees using the network to enhance service to constituents. Therefore, the City should help these employees become savvy using desktop and mobile devices and internet applications to enhance productivity and communications. This strategy supports **Objective 1: Improve Broadband Access for City Departments and Public Safety Agencies** by helping City employees become effective users of broadband. This strategy also supports **Objective 4: Promote Benefits of Digital Technology**.

Employees would benefit by being able to do their jobs better. Constituents would benefit when they receive better service and experience an easier time communicating with the City. The City would benefit from the time and money savings of increased employee efficiency and effectiveness. Constituents would benefit from the time and money savings of faster interactions with the City.

Furthermore, employees would benefit personally because they would be able to apply newly acquired digital literacy skills to their personal lives and promote the benefits of these skills to their friends, family, and colleagues.

## **Promote Existing Digital Literacy Programs**

The City should pursue many options to help employees improve their digital literacy skills, including connecting employees to existing digital literacy education programs that are available to all New Orleanians as described in the section on promoting digital literacy for the wider community.

## **Develop in-house digital literacy training for employees**

For employees who do not to pursue training outside of work, the City should collaborate with local universities, non-profits, Job1, and private firms with expertise in creating digital literacy curricula for adult learners. With its partner, the City can develop classes to teach employees to perform specific internet tasks that will improve their job performance and make their jobs easier. These classes in digital literacy could be added to the roster of classes the City already offers to its employees.

## **Develop Applications to Enhance Productivity**

Employees also will require productivity enhancing applications to enable them to use wired and wireless broadband to improve their work performance and make their jobs easier. The ITI department will need to work with other departments to understand their business needs and then develop applications to satisfy those needs. To ensure that employees who recently acquired digital literacy skills can use them, the applications must:

- Be relevant to their jobs
- Be easy to learn and easy to use
- Improve employees efficiency, accuracy, and effectiveness at their jobs
- Make employees' jobs easier – not harder
- Work on desktop and mobile devices to enable employees to work in the field

## **Implementation**

The proposed solutions to help City employees improve their digital literacy and increase their use of digital technology and applications on the job vary in their ease of implementation.

It will be relatively easy for the City to promote existing digital literacy training programs to employees. The City can include links to information about various programs on its employee intranet site and write blog posts encouraging employees to consider updating their digital literacy skills. In terms of phasing, the City could begin to promote existing digital literacy training to employees immediately.

Working with partners to develop a tailored digital literacy program to help employees use the internet to improve job performance will be more challenging. However, organizations, including the City, often develop training programs specific to their needs. The City should be able to create and begin teaching the targeted digital literacy curriculum in 1 year. Digital literacy education staff could provide classes open to all employees or work with individual departments a few at a time.

The most challenging task will be working with departments to develop web-based applications to meet their business needs. Because ITI regularly works with departments to develop and/or procure solutions to meet department needs, ITI staff has the skills and experience to accomplish this task provided it receives adequate input from staff in other departments. It should be possible to develop at least 1 web application that makes employees' jobs easier and enhances their performance within 2 years.

## Strategy 4: Support Pilot Networks

**Challenge:** Many low income New Orleans residents and businesses owners lack the broadband that is vital to function in the modern world.

Because one of the main barriers to broadband access for New Orleans' most disadvantaged people is the unaffordability of the ISPs' current broadband options, the City hopes to create pilot networks in publicly accessible City owned facilities throughout New Orleans to provide constituents with free wireline and wireless broadband access closer to their homes and businesses. Target locations include schools, libraries, community centers, police & fire stations, and other public buildings.

The City could deploy pilot networks itself or work with ISPs, philanthropies, and non-profit organizations to provide pilot networks in City owned sites open to the public.

In addition to pilot networks in City owned facilities offering free service, other pilot networks could provide low cost service to low income people at their homes, businesses, and non-profit organizations. Potential operators for pilot networks outside City owned facilities include:

- Incumbent ISPs
- New ISPs
- Philanthropies and non-profit organizations
- Firms that want to demonstrate new broadband technologies

With better broadband options via pilot networks, low income people could subscribe to broadband and use it to accomplish personal and professional goals in the same manner as higher income people.

To entice people without a lot of disposable income, operators of pilot networks likely will need to provide higher bandwidth options at a lower cost compared to incumbents to make the product sufficiently attractive. Therefore, the City's support of pilot networks buttresses **Objective 2: Facilitate Broadband Access for Low Income Residents and Businesses, Objective 3: Improve Bandwidth Options and Pricing for Residents, Businesses, and Non-profits, and Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience.**

The City recognizes the uncertainty that other organizations will choose to create a pilot network offering low-cost, high-speed broadband to New Orleans' homes and businesses. If this does not occur, then expanded public access in City-owned facilities is an alternative.

However, if other organizations develop pilot networks to serve New Orleans' homes and businesses, the City could assist with many aspects of network planning and implementation as discussed below.

**Determine Pilot Network Target Locations:** Before contemplating any specific relationship with other entities to create pilot networks, the City should determine which locations potential pilot networks should serve.

The City could develop a list of neighborhoods to target for better broadband access. These neighborhoods could be predominantly low income areas and areas ripe for infill development. Deploying pilot networks in infill development areas should serve Generation Y and people of color (both of whom are increasing as a share of the US population) because these groups typically prefer the compact, mixed use communities close to transit that often occupy infill sites.

The presence of mixed-use development on many infill sites offers an opportunity for retail and office users to split the cost of a fiber connection that none could afford individually or to expand broadband serving commercial premises to on-site residences for slightly more effort and money.

Based on the criteria above, Neighborhood Revitalization Strategy Areas (NRSAs) as defined for US Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) purposes could be possible targets for broadband pilot networks if the City has designated such areas. If not, network operators can adopt this program's eligibility criteria to determine where to operate pilot networks. The NRSA program's flexible procedures allow fund recipients to define target areas in their own terms. In this instance, HUD provides guidance, not rules. Additionally, the NRSA program has lesser data collection and reporting requirements than other programs.<sup>12</sup>

Pilot networks could use the Neighborhood Stabilization Program's (NSP2) criteria, which would allow network operators to target areas already receiving investment like sections of Central City, Mid-City, Seventh Ward, Fillmore, Gentilly, Milneburg, Gentilly Terrace, Lower Ninth Ward, and New Orleans East. The New Orleans Redevelopment Authority website has information on these areas <http://www.noraworks.org/>.

If pilot networks targeted people with income below a certain threshold, preliminary research suggests that network operators should serve households with income less than \$35,000 per year. These households are less likely to have home broadband access than households with higher annual income. In New Orleans, this would result in pilot networks concentrating on serving the following areas:

- Claiborne Corridor
- Central City
- New Orleans East

Developing a list of target neighborhoods or criteria to govern what people and places the City would like broadband pilot networks to serve would provide City staff with guidelines to govern conversations with outside entities that approach the City about pilot projects.

**Share Information and Resources:** The City could assist pilot network deployment by providing network operators with information about City permitting requirements, policies, and procedures, and the availability of City-owned buildings to use in mounting network infrastructure. For example, The City supported "Technology for All" in its efforts to educate the public about the potential to use parts of the analog spectrum for broadband by providing information. The City could assist future pilot networks by:

- Providing network operators with access to contacts in key community organizations
- Informing constituents about the availability of the pilot network

Organizations offering pilot networks geared to serving to low income constituents would need to understand the business aspects of the New Orleans broadband market, like customer segmentation, just as the ISPs do. Because these organizations would serve a price sensitive segment of the population, they would have to develop compelling products that are affordable to people without a lot of discretionary income. If organizations approached the City with offers to collaborate on improving broadband access for low income people, the City would need to obtain a legal review of the proposed partnership to ensure that it adheres to all applicable federal, state, and local laws as well as City policies and procedures.

Regardless of whether the City or another organization built and operated a pilot network, the network owner and operator would have to conduct the same data collection, network design, construction, and management tasks that the City would need to undertake to build an institutional network.

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<sup>12</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007 – pg. 10-2.

## Strategy 5: Educate People about Existing Lower Cost Broadband Access Options

**Challenge:** Many low income New Orleans residents, businesses, and other organizations lack the broadband internet that is vital to function in the modern world. Because one of the main barriers to broadband use for low income people is the unaffordability of broadband service, the Broadband Master Plan proposes solutions to address this specific barrier.

**Proposed Solution:** In the short term, the City should encourage low income people to take advantage of the ISPs' existing programs to provide low income people with affordable internet access. To accomplish this, the City will need to ensure that people eligible for such programs learn about the programs, their benefits, and the process to register for the programs. The City likely will need to work with community organizations to disseminate information about these programs and support people through the registration process. **Appendix J: Internet Access Programs for Low Income People** lists such programs operated by ISPs.

In addition, non-profit community organizations have developed programs to provide qualifying individuals and households with more bandwidth than the ISPs' programs. In the mid-term, the City should ask these organizations to expand their programs to New Orleans, which would provide New Orleanians with more low cost options and with higher quality low cost options.

Encouraging low income people to get broadband at home via existing programs can put them on the path to digital fluency and the ability to use broadband to improve their personal and professional lives.

Ideally, attaining basic broadband access at home now will help low income people become ready to take advantage of higher bandwidth service when that becomes available. This strategy supports

**Objective 2: Facilitate Broadband Access for Low Income Residents, Businesses, and Non-profits.**

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# Strategy 6: Enact Policies to Incent Telcos to Improve Service / Expand to New Areas

**Challenge:** Many low income New Orleans residents, businesses, and other organizations lack the broadband internet needed to function in the modern world. Because one of the main barriers to broadband access for low income people is the low quality of the internet services that they can afford, the Broadband Master Plan proposes solutions to address this specific barrier.

**Proposed Solution:** The City should create policies to encourage telecommunications firms that offer broadband in New Orleans to create products to meet the needs of the City's lower income households, businesses, and other organizations at affordable prices. Currently, low income residents, businesses, and organizations often cannot afford market rate broadband. Some struggle to pay for needed service while others do without broadband.

On the other hand, services developed specifically for the low income market frequently do not provide sufficient bandwidth and are difficult to access. **Appendix J: Internet Access Programs for Low Income People** discusses some of these programs.

Ideally, telecoms would replace low bandwidth, low cost options with higher bandwidth, low cost options. Perhaps, telecoms could offer free service to the very poorest people. The City should develop policies to incentivize telecoms to develop high quality, low cost options for lower income people. Proposed solutions may be place-based or people-based.

- Place based solutions aim to improve broadband access in locations where low income people live and work. For example, telecoms could create a less expensive, high-bandwidth broadband package to offer in income-restricted housing units. Place-based programs are relatively easy to implement because the service is offered in a limited geographic area.
- People-based solutions target people who fit certain criteria, regardless of where they live or work. For example, telecoms could subsidize broadband access for families with household-income below 400% of the poverty threshold. People-based programs typically are more difficult to administer because of the need to conduct "means testing" on applicants to limit receipt of benefits to qualified applicants. **Appendix A: Definitions** contains information about income requirements used to determine eligibility for federal programs.

This strategy directly supports **Objective 2: Facilitate Broadband Access for Low Income Residents, Businesses, and Non-profits** and **Objective 3: Improve Bandwidth Options and Pricing for Residents, Businesses, and Non-profits**. This strategy also indirectly supports **Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience**. The text below introduces policy ideas.

**Monitor ISP Service:** To encourage incumbent ISPs to improve the quality of internet service in New Orleans, the City should monitor various aspects of quality like bandwidth, data limits, reliability, etc. and inform telecoms that it will scrutinize their service.<sup>13</sup> The City should share this information with New Orleanians via a webpage on the City's website dedicated to broadband. **Strategy 7: Educate New Orleanians about Broadband**, discusses monitoring broadband in New Orleans in the context of educating people about broadband in more detail.

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<sup>13</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 12.

**Require Community Benefits Agreements:** Some municipalities use community benefits agreements to ensure ISPs serve their most vulnerable people. As noted in the discussion of place-based and people-based solutions, municipalities can structure community benefits agreements to ensure service to particular people or specific locations as needed. As part of its agreement with US Internet to provide wireless service to government, residents, and businesses, Minneapolis required the firm to:

- Donate 5% of profits to a “digital inclusion fund” dedicated to promoting affordable internet access, low-cost hardware, local content, and training
- Provide free, limited time service in some parks and plazas
- Provide free “walled garden” wireless service to allow everyone access to neighborhood, government, and community services information anywhere in Minneapolis<sup>14</sup>

Regardless of whether New Orleans attracts a new telecom like Minneapolis, or works with its incumbents, the City should consider negotiating community benefits agreements with its ISPs.

**Implement Demand Creation and Aggregation:** From an ISP’s perspective, there is significant risk in building, upgrading, or expanding a telecommunications network. If the new, upgraded, or newly expanded network does not attract enough customers who are willing to pay adequate prices, the telecom risks not earning enough money to pay its debts. This situation results in telecoms’ reticent behavior with regard to network deployment and upgrades.

However, communities that desire better broadband may be able to make their communities more attractive to the telecoms by demonstrating that the telecom will have enough paying customers to justify deployment costs. This could involve surveying members of the community to determine what services they need and their ability and willingness to pay and sharing this information with telecoms.

Communities also can help provide telecoms with customers by creating demand for broadband service.

- **Demand Creation** – The promulgation of e-government offers one avenue for demand creation as government and constituents share more data electronically. Furthermore, because e-government applications require certain levels of bandwidth, security, reliability, etc., the adoption of e-government could incent ISPs to upgrade broadband to meet the increased expectations of municipal and other users.
- **Demand Aggregation** – The City could map clusters of small users in close geographic proximity and facilitate introductions between these users. Then, users could negotiate together for future broadband service to obtain a better price than they could individually. The City could focus on commercial users and require businesses to register to receive notification that nearby users want to work together to negotiate with telecoms.

Additionally, mixed-use development on infill parcels offers an opportunity to create new clusters of small users. The City could introduce its demand aggregation program to developers and their tenants while the site is under construction or soon after.

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<sup>14</sup> “Wireless Minneapolis History,” USI Wireless, <http://www.usiwireless.com/service/minneapolis/history.htm>, accessed November 2013.

As shown in the following table, which summarizes the broadband attributes of businesses by size and type, small businesses and medium-sized businesses typically subscribe to cable or DSL because they cannot afford fiber. These are the businesses the City could target with a Demand Aggregation policy.

<b>General Broadband Profile for Businesses – By Size and Type<sup>15</sup></b>						
<b>Type of Business</b>	<b>Example</b>	<b>Current Products Used</b>	<b>Monthly Affordability Range</b>	<b>Short-Term Benefits from Next-Generation Broadband</b>	<b>Long-Term Benefits from Next-Generation Broadband</b>	<b>Ability to Pay for Next-Generation Services</b>
Small Traditional Businesses	Restaurants, Small Markets, Hardware Store	DSL or Cable Entry-Level Products	< \$100	Low	High	No
Small Professional Businesses	Engineering Firms, Architects, Doctors	DSL or Cable Premium Products	\$50 - \$250	High	High	No
Small “Big-Data” Centric Businesses	GIS Mapping, Software Development, Web Analytics	DSL or Cable Premium Products	\$50 - \$500	High	High	No
Medium Businesses		DSL or Cable Premium Products Fiber	\$50 - \$2,000	High	High	Some
Enterprises		Fiber	> \$2,000	Low	High	Yes

<sup>15</sup> Magellan Advisors, “Next-Generation Broadband Feasibility Study” for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, July 16, 2014, pg. 20.

- CrowdFiber, an online tool developed by the broadband consulting firm Civitium, supports the process of aggregating demand.

Using the tool, deployers and community groups can organize campaigns for fiber deployments and request pledges from would-be customers, called “backers.” Backers express interest by noting their location and pledging funds at various levels. The campaign owner defines geographic zones and assigns backers to the zones based on location. Campaign owners can review the number of backers and money pledged to determine which zones have sufficient demand to justify rolling out fiber.<sup>16</sup>

Until a campaign is successful, CrowdFiber does not reveal backers’ identities or addresses and does not redeem their pledges. (However, campaign owners can send email updates to backers through CrowdFiber.) Once a campaign reaches its stated goal – defined by number of backers or dollars pledged – the campaign owner receives backer ID information and the pledged funds. The campaign owners may apply the funds toward monthly fees, connection fees, reimbursement of CrowdFiber charges or other purposes.<sup>17</sup>

CrowdFiber’s flexibility lends itself to various uses. In the “infill” model, an ISP with a DSL, cable or wireless network could identify zones where fiber upgrades seem feasible and notify customers in those zones that it will install fiber to the home if sufficient demand exists. CrowdFiber would invite customers to indicate their support and share information with friends and neighbors through social media.<sup>18</sup>

In the “edge-out” model, an ISP with an existing fiber network would import GIS data for its fiber routes, splice points, enclosures and other assets. Using this data, it would create zones around points from which it could easily extend its network. The ISP would invite potential backers to search their address to learn if they lived in a designated expansion zone.<sup>19</sup>

A community organization would use a “greenfield” model, designating zones where it thinks fiber networks might be in high demand or might be useful to economic development. If enough backers responded to the campaign, the organization could build its own network or give the aggregated data to the local service provider. Communities with sufficient demand would be able to use the data to counter incumbent claims that demand does not exist.<sup>20</sup>

Please visit the CrowdFiber website, <http://crowdfiber.com/>, to explore existing campaigns in several communities across the country.

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<sup>16</sup> Masha Zager, “Using the Wisdom of the Crowd To Guide Fiber Deployment,” Broadband Communities, <http://www.bbpmag.com/MuniPortal/EditorsChoice/0713editorschoice.php> (accessed April 1, 2015).

<sup>17</sup> Masha Zager, “Using the Wisdom of the Crowd To Guide Fiber Deployment,” Broadband Communities, <http://www.bbpmag.com/MuniPortal/EditorsChoice/0713editorschoice.php> (accessed April 1, 2015).

<sup>18</sup> Masha Zager, “Using the Wisdom of the Crowd To Guide Fiber Deployment,” Broadband Communities, <http://www.bbpmag.com/MuniPortal/EditorsChoice/0713editorschoice.php> (accessed April 1, 2015).

<sup>19</sup> Masha Zager, “Using the Wisdom of the Crowd To Guide Fiber Deployment,” Broadband Communities, <http://www.bbpmag.com/MuniPortal/EditorsChoice/0713editorschoice.php> (accessed April 1, 2015).

<sup>20</sup> Masha Zager, “Using the Wisdom of the Crowd To Guide Fiber Deployment,” Broadband Communities, <http://www.bbpmag.com/MuniPortal/EditorsChoice/0713editorschoice.php> (accessed April 1, 2015).

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# Strategy 7: Educate New Orleanians about Broadband

Research indicates many people eschew using the internet because they don't understand the potential benefits of internet use or because they fear that going online will risk their safety and security. Others would like to obtain broadband but don't feel that they have the knowledge to evaluate telecommunications products and services.

The City should address these concerns via a public education campaign to demonstrate broadband's benefits, address fears about using the internet, and teach people how to be thoughtful broadband consumers. This strategy addresses **Objective 4: Promote Benefits of Digital Technology**. This section discusses several possible components of a broadband education strategy.

## Demonstration Projects

The City could install a gigabit fiber telepresence demonstration project in a prominent location such as the Downtown portion of the Claiborne Corridor. The demonstration would allow New Orleanians to see the superiority of fiber compared to cable and DSL.

One idea for the demonstration is an online jam session involving musicians in New Orleans and their counterparts in various worldwide locations. The jam session could be broadcast in real time in other locations throughout the City like the Convention Center, Jackson Square, and City Park.

The demonstration project also could include information on other ways to use gigabit fiber like online medical appointments and remote collection of environmental data. Once people see the possibilities inherent in high-speed broadband, they can start to think about how to apply broadband in their lives. Ideally, this will entice people to want to learn more how to purchase and use broadband.

## Create Opportunities for Constituents to Use Broadband

In addition to showcasing the marvelous uses of gigabit fiber, the City also can show New Orleanians how to utilize the cable and DSL internet already available in New Orleans to improve their lives. One way to do this is by providing opportunities for New Orleanians to use broadband.

**Telecommute:** The City could set an example for other employers by developing programs to allow employees to telecommute, if their jobs do not have to be performed in a specific location. They could connect other employers to federal resources explaining the benefits of telecommuting such as:

- Environmental improvements like reduced congestion and fossil fuel use from trips avoided.
- Workplace benefits - increased flexibility to allow employees to balance their work and home lives, which helps improve morale and also may increase employee effectiveness.<sup>21</sup>

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<sup>21</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 13, 20.

**Online Services:** The City should report information online and deliver as many public services as possible online to reduce vehicle trips taken and associated environmental impacts.<sup>22</sup> Although the City will have to continue to provide information and public services via other means like printed publications and in-person and phone conversations, the online option can help many New Orleanians save time and money and possibly reduce their contribution to air pollution by avoiding trips.

The City shares a wealth of information via its [nola.gov](http://nola.gov) website and has created online options for many transactions with the City via its OneStopShop website. The City should continue to create online options for sharing information with the public and allowing the public to conduct transactions with the City. Ideas for new online services include:

- **Interactive real-time online public meetings:** Currently, the City broadcasts public meetings online in real-time as they occur. However, people who are not in the room cannot participate. For certain types of public meetings, adding interactive capacity to allow constituents to participate in meetings remotely<sup>23</sup> may increase public participation by allowing people who cannot travel to the meeting to participate.

## Consumer Education - Evaluating Broadband Services

Currently, most ISPs offer a suite of confusing telecom products that vary in terms of services offered (voice, data, video, any 2 out of 3, or all 3 combined), bandwidth options, and data transmission limits. Furthermore, these products come with a nebulous pricing scheme.

Although ISP websites contain information about the various cable, data, voice, and combined packages the ISP offers, the presentation of information often obscures options rather than clarifying them. For example, on most ISP websites, it is fairly easy to compare data only plans to each other or peruse the triple-play packages because the information is on the same webpage. However, it is not easy to compare plans that are not in the same category. For example, comparing data only plans to voice+data plans to triple play packages is difficult because the information often is scattered across different pages of the website making it difficult for consumers to determine which combination of ISP products is the best choice for their needs.

This problem is exacerbated when consumers attempt to compare multiple product and pricing options from several ISPs. The time and difficulty of gathering information about many products from each carrier discourages many consumers from investigating all options. Instead, they select internet service and continue to use that product for years, even when better products become available, because the burden of researching other choices is too great. Or, they forgo internet service.

One way to address this problem is by helping New Orleanians to become better consumers of broadband internet services via consumer education teaching people how to evaluate broadband service. Without addressing technical details, the program could explain concepts like bandwidth and data transmission limits. The program also could provide basic questions consumers should ask ISPs when gathering information about telecom products. This should help New Orleanians to select the best service for their needs among the available options.

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<sup>22</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 10.

<sup>23</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 20.

## Communications

The public education campaign should offer information in many formats, including digital literacy classes, video programming on public access TV channels, webinars, and printable PDF to reach people at various stages of the journey to digital fluency from those who have never considered using broadband to those who already understand its benefits and want more information.

**Public Forums:** Communication with constituents should include meetings in locations the public regularly visits like churches, community centers, local businesses, etc.<sup>24</sup> These “Community Connect Fairs” typically bring resources to constituents. For example, along with an overview of broadband, such events may include an introduction to businesses that sell refurbished computers and organizations that offer digital literacy training<sup>25</sup>

**Public Service Announcements:** The City also should sponsor public service announcements on local government and community access channels. The PSAs could introduce viewers to the benefits of broadband and provide tips on evaluating and purchasing broadband services. The PSAs also could advertise public forums, classes, websites, and other methods to get more information.

California created *Get Connected!* radio and television spots in multiple languages. Sponsors could add their name and tagline before airing.<sup>26</sup> Visit <http://getconnectedtoday.com><sup>27</sup> for more information.

**City Website Broadband Page:** The City should create a page on the City website to provide information about fiber broadband, including what it is, how using it can benefit New Orleanians, links to digital literacy education, information about internet service providers and links to their websites, and information about affordable broadband access programs geared to low income people and links to those websites.

The City should also share broadband subscription rates in New Orleans on its broadband page to enable policy makers and the public to know the current subscription rate and to track progress in bringing more New Orleanians online. Because the free broadband subscription data from the FCC is available only in quintiles, it may be necessary to purchase broadband subscription data for New Orleans so the project team can get more precise data needed to establish a baseline and measure changes from the baseline.

The City’s broadband page also should contain links to websites that allow people to check their internet connection speed (bandwidth). The page should also allow people to share their bandwidth anonymously.

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<sup>24</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 14.

<sup>25</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 14.

<sup>26</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 14.

<sup>27</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 14.



Gathering and sharing bandwidth data would allow New Orleanians to know the bandwidth they receive compared with the bandwidth for which they are being charged by the telecoms. This information also would allow the City to establish baseline bandwidth in New Orleans and monitor bandwidth on an annual level to determine if typical bandwidth is improving. Ideally, with more information, New Orleanians would become more capable of evaluating information about broadband.

The City's broadband webpage also should include information about broadband available in places like Chattanooga, TN, Santa Monica, CA, and other US and international cities, including typical bandwidth and prices as well as information about the entity providing the service. With the inclusion of appropriate data and links, the City could use a broadband web page to educate people about broadband inequities and inspire them to demand more from the telecoms.

## **Partnerships**

Depending on the project and its desired level of involvement, the City could undertake these projects directly or work with partner organizations.

## **Digital Literacy Training**

In addition to knowing how to use broadband to improve their lives and understanding how to evaluate and purchase broadband, many New Orleanians will need instruction in how to use broadband. Digital Literacy Training, a key component of the Broadband Master Plan, is the subject of the next section.

# Strategy 8: Promote Digital Literacy Training

**Challenge:** Many low income New Orleans residents, business owners and operators, and people who run organizations dedicated to serving low income people lack broadband internet, which is vital to function in the modern world. Because one of the main barriers to broadband access for New Orleans' most disadvantaged people is lack of digital literacy, the Broadband Master Plan addresses this barrier.

**Proposed Solution:** To truly benefit from expanded broadband availability, New Orleans must develop a "digital culture." The mere presence of technology is insufficient. Rather, the digitally literate must help the digitally non-literate partake in digital culture. This section describes many ways the City can support efforts to improve digital literacy among New Orleanians without adequate technology skills.

1. The City should promote digital literacy to New Orleanians who lack adequate digital literacy skills, including residents, City employees, and people who operate businesses and other organizations that serve low income people. This should involve showing information technology neophytes the many benefits that accrue from using IT like enhanced communication via email and social media, enhanced information gathering via websites and social media, and the ability to avoid travel by conducting transactions from home or work.
2. The City should connect these residents, City employees, and operators of businesses and organizations that serve low income people to successful digital literacy training programs. **Appendix K: Digital Literacy Training – New Orleans** lists some of New Orleans current digital literacy training programs and programs that are under development.
3. The City should try to attract successful digital literacy programs developed in other locations to New Orleans. **Appendix L: Digital Literacy Training – Other Locations** lists some such programs.
4. The City should collaborate with public, private, and non-profit organizations to develop and deliver new digital literacy training programs. Ideal partners would be organizations with experience providing computer literacy education to low-income people.
5. The City should offer the use of City facilities to organizations offering digital literacy training.
6. The City should encourage digitally literate employees to volunteer as digital literacy tutors.

## Attributes of Successful Digital Literacy Training Programs

As described in the report, **"Broadband Around the World,"** people use their digital literacy to access jobs, opportunities to improve skills, and information to make better decisions about money, healthcare, education, consumer products, housing, and other aspects of professional and personal life.

However, technologically disadvantaged people will not receive these benefits unless they acquire and apply digital literacy skills. Society can help by providing digital literacy training targeted to the needs of technologically disadvantaged people. The City should identify successful digital literacy programs and promote these to people who need to upgrade their digital literacy skills.

Because students need to learn different skills and prefer different instruction methods, there are a variety of digital literacy training programs available. Successful programs achieve the following objectives.

1. Explain the advantages of digital literacy to motivate people to work to gain digital literacy skills
2. Help learners expand their technical computer skills
3. Help learners improve cognitive skills in accessing, evaluating, using, and creating information on the internet

The most successful programs develop relevant content. To remain pertinent to a wide range of people, in addition to standard technology instruction, these programs also:

1. Develop content relevant to older, poorer, disabled, minority, and rural Americans
2. Develop content and training in people's native languages
3. Help people with disabilities use special devices to access computers, phones, and internet
4. Implement effective outreach and marketing techniques to raise awareness of the benefits of digital literacy and their program's effectiveness in teaching digital literacy among the target stakeholder(s), including hard-to-reach and change resistant populations.

Once people acquire digital literacy, they can use those skills to access education or vocational training. Research shows that technology-based instruction reduces the time and cost to deliver vocational training by 1/3 while increasing effectiveness by 1/3. Therefore, for economically disadvantaged people, digital literacy can help them acquire training faster and at a lower than expected cost.

In addition to linking residents in need of training with existing digital literacy programs, the City also could entice non-profit organizations and for-profit firms from outside the City to offer their digital literacy training programs in New Orleans. **Appendix L: Digital Literacy Training – Other Locations** discusses innovative digital literacy education programs developed in other communities that New Orleans could try to attract.

**Provide students with low cost digital devices:** Many digital literacy programs provide participants with free or low cost digital devices upon program completion. Continued internet access allows students to improve the recently learned skills rather than forgetting what they just learned.

Like many large organizations, the City has a schedule for replacing IT devices like desktop and laptop computers, servers, cell phones, and tablets. The City could recycle these devices by giving them to low income families and/or non-profits.<sup>28</sup>

While these devices may not meet the standards for enterprise use, they may be serviceable for personal use. In this manner, the City can utilize a sustainable solution that helps low income people acquire needed equipment while diverting electronic waste from landfills.

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<sup>28</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 13.

# Strategy 9: Connect Low Income New Orleanians with Broadband Installation Jobs

The construction of a City-owned institutional fiber network will require the skills of fiber optic technicians, the individuals who install and repair fiber infrastructure. Typically, fiber optic technicians earn salaries comparable to other skilled tradespeople, an average of \$51,720 per year,<sup>29</sup> which is significantly above minimum wage. The City should try to ensure that New Orleanians perform the majority of this well-paid work if and when it builds a fiber network.

Ideally, New Orleans entry level workers would train to become fiber optic technicians. Their new skill set would allow them increase their earnings significantly. As a result, they could improve their standard of living and provide new opportunities in education and other areas of life to themselves and their families. Simultaneously, unemployed New Orleanians could fill newly available entry level jobs as the former job holders move into higher paying positions as fiber optic technicians.

This strategy supports **Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience.**

Other regions have taken advantage of large infrastructure construction projects to match low skill individuals with training and decent paying jobs to allow these people to exit poverty. The California High-Speed Rail Authority negotiated a comprehensive "construction careers" program with the State Building and Construction Trades Council of California. This program provides disadvantaged and unemployed workers access to apprenticeship programs to learn to design and construct the rail line.<sup>30</sup>

The inspiration for California's program is one developed by Los Angeles Metro in 2011 that has put thousands of disadvantaged people into union apprenticeship programs. Those who finish are prepared for careers as electricians, pipe fitters, or sheet-metal workers.<sup>31</sup>

New Orleans should develop a similar program to direct willing low income individuals into fiber optic technician jobs. In this manner, the City could use the construction of its proposed institutional fiber network to improve residents' skills, provide them with future career options, and create the workforce needed build and maintain the proposed network, all while providing people with a path out of poverty.

The City would need to collaborate with other entities to create and administer an apprenticeship program to train individuals for fiber optic technician jobs. Potential partners and the services they could provide are listed below.

- Job1 – candidate screening
- Delgado Community College – classroom training
- Construction firms – on-the-job training and jobs

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<sup>29</sup> Fred Decker, Demand Media, "How Much Does a Fiber Optic Technician Make?" Houston Chronicle, <http://work.chron.com/much-fiber-optic-technician-make-1736.html>, accessed March 4, 2015.

<sup>30</sup> Madeline Janis, "High-speed job creation for California" Los Angeles Times, <http://www.latimes.com/opinion/op-ed/la-oe-janis-high-speed-rail-20140623-story.html>, June 23, 2014.

<sup>31</sup> Madeline Janis, "High-speed job creation for California" Los Angeles Times, <http://www.latimes.com/opinion/op-ed/la-oe-janis-high-speed-rail-20140623-story.html>, June 23, 2014.

Fortunately, the City has experience developing such partnerships. In recent years, the City brought together Job1, Delgado Community College, and local hospitals to develop programs to train New Orleanians for healthcare jobs and place them in those jobs. Low income New Orleanians benefit by gaining access to better paying, career path jobs. The hospitals benefit by gaining employees who can perform the work, addressing challenges with the quality of the work force and with staff attrition.

The City could apply lessons learned developing a pipeline to healthcare jobs to the challenge of developing a pipeline for fiber technician positions.

# Strategy 10: Engage in Broadband Advocacy

In addition to educating New Orleans residents and business owners, the City should collaborate with other municipalities, states, and broadband advocacy organizations to inform elected officials and people outside New Orleans about:

- Broadband's importance in modern life
- Barriers low income people face accessing broadband and the resulting impact on access to information and opportunities
- The range of solutions to help low income people access better broadband at an affordable price, including municipal involvement in broadband planning and provision
- Telecom opposition to municipal involvement in broadband

This strategy supports **Objective 4: Promote Benefits of Digital Technology** and **Objective 5: Support City Aspirations to foster Equity, Economic Development, and Resilience**.

## Broadband Advocacy

Many municipalities have developed successful strategies to improve broadband quality and affordability in their communities. These strategies include:

- Attracting a new private-sector ISP to their jurisdiction
- Building a municipally owned network

However, these options are not politically feasible in some locations because public opinion is hostile to the options. In some areas, these options are illegal because state laws prevent municipalities from pursuing partnerships with the private sector or from building a municipally owned network. In other instances, state laws force municipally owned networks to satisfy extra requirements which decrease the networks' financial feasibility. Because laws vary by state, a solution developed in one city may not be implementable elsewhere, even if market conditions suggest the solution could work otherwise.

The immediate goal of broadband advocacy is to increase the number of people, including local, state, and federal legislators, who understand broadband's importance, the barriers low income people face accessing broadband, and the challenge of improving access for low income people.

The long-term goal is to change public opinion and eventually state laws so that communities working to improve broadband access can realistically consider a wider range of possible solutions, including partnership with the private sector or building their own networks, if they cannot convince the private sector to provide more bandwidth and higher data transmission limits at lower prices.

Having more options should make it easier for the City of New Orleans (and all municipalities) to address broadband issues in mid and long term. Increasing awareness and understanding of this issue is the first step in generating support from residents and elected officials to develop and implement solutions, up to and including municipally owned solutions, if necessary.

To be effective broadband advocates, project staff must remain informed about broadband technology, market conditions, and the broadband policy landscape. Staff will have to monitor the following items:

- Existing federal, state, and local laws and possible changes to these laws
- Existing federal and state policies regulating broadband and possible changes to these policies
- Shifts in opinion by legislators, agency regulators, and the general public
- Emerging wireline and wireless broadband technologies

By remaining informed, project staff and City staff will have the knowledge to participate in the national discussion of broadband issues by working with other municipalities to educate the public and elected officials on the following issues:

- **National standards on broadband parameters:** For New Orleans and other American cities to compete with international peers, the United States' cities need comparable broadband. While the Federal Communications Commission's (FCC) recent increase in the minimum standard for acceptable broadband to 25 mbps download and 3 mbps is a vast improvement compared with previous standards, it still is inadequate when our international peers (who are also our competitors) can offer their constituents 1 gbps for upload and download. The use of inadequate benchmarks masks the severity of the digital divide and allows the US to delay action addressing this issue. Broadband advocates (which include cities) need to educate officials on adequate benchmarks to use to evaluate broadband quality and price.
- **Components of broadband access:** As the layer of government that provides many services directly to constituents, municipal staff interact with people and organizations and can observe the importance of broadband access, disparities in broadband access, and impacts from disparities in broadband access. Municipal staff also have the in-depth knowledge of their communities to develop strategies to address disparate broadband access and overcome barriers to enacting those strategies as summarized in the companion reports - "Broadband – the World's Newest Public Utility" and "Broadband Around the World."
- **Possible legislative support for broadband:** Municipal staff can educate law makers on opportunities for the legislature to help municipalities improve broadband access by reducing state-level barriers to municipal provision of broadband services. Municipal staff can explain to state legislators why the legislature should repeal restrictions on municipal provision of broadband. Municipal staff can explain to federal legislators why Congress should support a version of the Community Broadband Act, which would prevent state governments from enforcing or adopting laws to prohibit municipalities from providing broadband services.

As currently contemplated, the Community Broadband Act also would:

- Promote the use of public-private partnerships to spread the use of broadband services
- Require public providers to announce their intention to offer broadband services to the public, including the types of services contemplated
- Give private providers the opportunity to provide alternative broadband services
- Ensure public and private broadband service providers are treated equally with respect to the laws, guidelines and policies that apply to all broadband service providers<sup>32</sup>

While project staff support a ban on state legislation prohibiting municipal broadband provision, project staff also believe that certain clauses of the current version of the Community Broadband Act could be problematic. These include the requirement that ISPs be offered an opportunity to provide alternative broadband service and the requirement to treat public and private broadband service providers equally. Depending on interpretation, both provisions could be used to hinder municipal broadband development without necessarily prompting broadband development by ISPs.

For example, ISPs facing the prospect of a municipal network could offer to build or upgrade networks. Then, they could delay construction, leaving the community with neither a public nor a private option. Therefore, project staff believes that some portions of the proposed

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<sup>32</sup> Wikipedia - [http://en.wikipedia.org/wiki/Community\\_Broadband\\_Bill](http://en.wikipedia.org/wiki/Community_Broadband_Bill) (accessed March 13, 2015).

Community Broadband Act may require revision before the legislation becomes a valid tool to protect the ability of municipalities to build networks when the ISPs have chosen not to do so.

### **Ease of Implementation**

Implementation of this strategy would be relatively easy. New Orleans could participate in the efforts of existing organizations to advance the conversation in this area. Below is a partial list of organizations that are interested in the municipal broadband conversation.

- National League of Cities
- National Association of Telecommunications Officers and Advisors (NATOA)
- Louisiana Broadband Advisory Council
- Next Century Cities (NCC)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Planning Association (APA)

Both NATOA and APA organize a lobby day each year to allow members to address Congressional representatives on issues that are important to their organizations. New Orleans could opt to participate in lobby days or in developing materials to explain the municipal perspective on low income broadband access, municipal involvement in broadband planning, and any other relevant aspects of broadband planning and policy.



# Implementation

The Broadband Master Plan includes many possible strategies for consideration. Project staff and City leadership will need to evaluate each strategy and its sub-strategies to determine which to implement and the appropriate order in which to implement chosen strategies.

Full implementation of the Broadband Master Plan likely will require several years and the involvement of dozens of stakeholders within and outside of city government. During this time period, it is likely that the project will encounter many impediments. A non-exhaustive list of possible obstructions includes:

- Technical issues like network design challenges
- Financial problems like finding money to pay for programs
- Potential disagreements with project partners
- Apprehension about the project from City staff, elected officials, and the general public

To ensure a successful implementation, project staff responsible for project management will need to anticipate possible complications and develop strategies to address these hurdles. This section discusses methods to manage the challenges inherent in a long-term, multi-pronged Broadband Master Plan that encompasses many disparate projects ranging from public outreach and education to infrastructure design, construction, and management.

**Public Involvement:** One tool to manage project challenges is public involvement. Regular and meaningful communication with stakeholders can:

- Provide project staff with data and information to improve the project
- Inform the public about the project, which can reduce stakeholder apprehension and manage stakeholders' expectation
- Entice community members to support the Broadband Master Plan

With the basic framework for a Broadband Master Plan complete, project staff should to re-engage stakeholders during the implementation phase, as described above.

**Project Goals and Milestones:** Milestones are another commonly used project management tool.

Tracking progress toward ultimate goals via the use of intermediate milestones can provide project staff with information needed to evaluate strategies to determine if they are progressing toward desired goals or if the project team needs to change strategies to achieve a particular goal. Additionally, seeing progress toward goals can help project staff and stakeholders realize what they've already accomplished and motivate them to do the work to continue making progress toward a goal.

When implementing a strategy, project staff should work with stakeholders to develop SMART goals (as discussed in the prior discussion on performance management) and intermediate milestones to track progress toward these goals.

**Institutionalization of Broadband Master Plan:** Because the Master Plan requires the execution of several different strategies, each with component sub-strategies, its multi-year implementation likely will span across multiple administrations.

Although all administrations provide services to constituents, typically each administration focuses on a few key areas which vary dramatically depending on municipal needs, the desires of its residents and business owners, and the talents and interests of elected officials.

Therefore, it is entirely possible that a new mayor and city council could decide to focus on different priorities than the previous administration. In this manner, it is possible for important, long-term projects to fail because the projects no longer receive the attention required for successful completion.

Due to its complexity and the long timeframe needed for full implementation, the Broadband Master Plan is at risk of not being implemented if future administrations choose to focus on other priorities. Therefore, a plan for implementation should recognize this risk and seek to mitigate it as much as possible. The text below describes possible strategies to reduce this risk.

**Independent of politics:** The need for broadband is independent of politics. People of all political persuasions or none at all use broadband. Communities in conservative states and in liberal states have built their own networks. Therefore, despite the attempts of some individuals to politicize government involvement in broadband, project staff must portray broadband in a non-political, non-partisan fashion. This should help people to view the Master Plan and the individual strategies in it as something for the community to implement to improve the lives of community members, rather than a project tied to the presence of particular elected officials or administration staff members.

**Community Consensus on Master Plan:** For the Broadband Master Plan to be successful, New Orleanians need to embrace it. For the community to embrace the Plan, they need to be involved in creating it, which is the part of the reason why public involvement is so important, as discussed earlier.

**Mechanism to update the Broadband Master Plan:** Inevitably, conditions in the community and in the broadband market will change. Therefore, project staff and the City may need to adapt some of the strategies included in the Broadband Master Plan to meet future conditions. Project staff may need to have a plan for updating the Broadband Master Plan, when needed. This update mechanism could be informal or formal, depending on the magnitude of the proposed change.

# APPENDIX A

## Definitions

### Low-income Family or Household

To determine eligibility for assistance programs, the City of New Orleans often follows the rules of the Community Development Block Grant (CDBG) program administered by the United States Department of Housing and Urban Development (HUD).

The CDBG program allows grantees to use any 1 of 3 definitions of income:

1. Annual income as defined under Section 8
2. Annual income as reported on the Census long form
3. Adjusted gross income as defined by the IRS Form 1040<sup>33</sup>

To establish program eligibility for CDBG funds or for any program that follows CDBG guidelines, grantees must compare income (as defined above) to HUD's income limits for its Section 8 program. The table below shows HUD's 2014 Section 8 income limits in dollars by family size for Orleans Parish.

Fiscal Year 2014 Income Limits Summary <sup>34</sup>									
Median Income	Income Limit Category (% of median income)	Persons in Family							
		1	2	3	4	5	6	7	8
58,800	Extremely Low (30%)	12,400	15,730	19,790	23,850	27,910	31,970	36,030	38,850
	Very Low (50%)	20,600	23,550	26,500	29,400	31,800	34,150	36,500	38,850
	Low (80%)	32,950	37,650	42,350	47,050	50,850	54,600	58,350	62,150

As shown above, the Section 8 Area Median Income for Orleans Parish, which is contiguous with the City of New Orleans, is \$58,800. Income limits for extremely low income range from \$12,400 for a single person to \$38,850 for a family of 8. Likewise, income limits for very low income range from \$20,600 for a single person to \$38,850. Last, income limits for low income range from \$32,950 for a single person to \$62,150 for an 8-person family.

Due to recent changes in how HUD defines extremely low income compared to very low income, the extremely low income limits may equal the very low income limits as shown by the fact that 7 or 8-member families qualify as both extremely and very low income with the same annual income.<sup>35</sup>

HUD requires that CDBG grant recipients spend at least 70% of money received on low or moderate income families or households, if a project's objective is to benefit low and moderate income people. Furthermore, HUD prefers that CDBG funds primarily benefit low income rather than moderate income people.<sup>36</sup> While moderate income families earn more than their low income counterparts, many do not

<sup>33</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007, pg. 1-4, 1-5.

<sup>34</sup> HUD website, <http://www.huduser.org/portal/datasets/il/il2014/2014summary.odn> (accessed July 15, 2014).

<sup>35</sup> HUD website, <http://www.huduser.org/portal/datasets/il/il2014/2014summary.odn> (accessed July 15, 2014).

<sup>36</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007, pg. 3-2 to 3-4.

earn enough money to pay market rate rent comfortably. Therefore, certain programs, like CDBG, offer them limited assistance.

In this manner, HUD ensures that CDBG funds primarily help the targeted population, low income people, while giving project sponsors flexibility to pursue projects that also benefit the wider community – moderate income people and those of greater means. Depending on the project, the spatial proximity of people with greater financial resources or the need to include people of greater means to subsidize a project may dictate that a project will serve people besides the low or moderate income people.

Depending on the availability of a well-established City procedure for determining income eligibility, the City can adopt the Section 8 income limits and the CDBG methodology to determine which low income residents to target with various Broadband Master Plan programs.

## **Low Income Area**

Projects whose objective is to benefit a low and moderate income area must meet the following criteria:

- Project must benefit all area residents
- At least 51% of area residents must be low or moderate income as determined by the most recent decennial Census, together with the Section 8 income limits applicable at the time of the Census or a current survey of area residents' incomes.<sup>37</sup>

Alternatively, the 51% threshold can be applied to project beneficiaries rather than to all area residents.

- For example, if the project involves building or rehabilitating housing, 51% or more of residents must be low or moderate income.
- If the project involves job creation, 51% or more of the newly created jobs must be filled by low or moderate income people.<sup>38</sup>

If the City does not have a well-established procedure to determine which areas of the City are inhabited by mostly low or moderate income people, the City could use HUD's Section 8 income limits, Census data, and the CDBG methodology or it can develop an alternative methodology.

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<sup>37</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007, pg. 3-2 to 3-4.

<sup>38</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007 – pp 3-7 to 3-10.

# APPENDIX B

## City of New Orleans Stakeholder Agencies

Project staff identified these agencies as most likely to benefit from improved mobile broadband; project staff spoke with department heads for some of these agencies to understand their specific needs for mobile broadband as discussed in the body of this report.

Mayor's Office  
City Council  
City Planning Commission  
Code Enforcement  
Hazard Mitigation Office  
Health Department  
Historic District Landmarks Council  
Human Services Department  
Job 1  
Mosquito, Termite & Rodent Control Board  
Neighborhood Engagement  
New Orleans Recreation Development Commission  
Parks and Parkways  
Property Management  
Public Works  
Public Library  
Revenue  
Safety and Permits  
Sanitation  
Vieux Carré Commission

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# APPENDIX C

## Partnerships

### Other City Agencies

Other City agencies are natural partners in an institutional network because their staff serves the same constituents as City departments, the residents and business owners of New Orleans. Therefore, staff in these agencies could use better broadband to foster the same efficiency and effectiveness improvements in their service to New Orleanians. Even if the City does not collaborate with outside agencies initially, there could be an opportunity to work together in the future as the City expands its institutional network. Below is a list of outside agencies that are possible partners for the City.

- Historic Districts Landmark Commission (HDLC)
- Housing Authority of New Orleans (HANO)
- New Orleans Recreation Development Commission (NORDC)
- New Orleans Redevelopment Authority (NORA)
- New Orleans Public Library (NOPL)
- Parks and Parkways
- Public Works (DPW)
- Public Works – Traffic Division
- Vieux Carre Commission (VCC)

Because fiber installation will use City owned property and rights-of-way, as network planners, ITI must work with the outside agencies that oversee City property and rights-of-way, DPW and Parks and Parkways. Therefore, ITI will need the cooperation of these departments and must treat them as valuable partners during the design and construction process.

Likewise, the City may be able to use NORDC and NOPL locations to provide free broadband access to the public and to mount network infrastructure.

Although the ITI department handles some telecommunications tasks for NORDC, NOPL is a separate agency with its own IT department and suite of agreements with telecommunications service providers. Therefore, partnership with NOPL (and other City agencies that ITI does not serve currently) offers a chance to expand the network's footprint if those entities subscribe to broadband service with the City rather than merely allowing the City to install network assets on their buildings.

On the other hand, the City would have a different type of partnership relationship with HDLC and VCC. The City would need to obtain their official approval to install infrastructure on certain locations on buildings in historic areas regulated by these agencies.

Clearly, the planning, design, and construction of the institutional network will be a complex task that will require ITI staff to interact with many other City departments in various contexts, only some of which were introduced above.

## Other Local Organizations

In the future, if the City considered expanding its network beyond City owned and operated sites, the following local organizations could be potential partners.

- Downtown Development District (DDD)
- New Orleans Regional Transit Authority (NORTA)
- Orleans Parish School Board (OPSB)
- Orleans Parish Courts
- Orleans Parish Sheriff
- Recovery School District (RSD)
- Sewerage and Water Board of New Orleans (SWB)
- Local Hospitals
- Local Universities
- Non-Profits
- Entergy
- Telecoms

Because network deployment will involve burying some fiber in the ground, the Sewerage and Water Board is another key stakeholder with which the ITI department must coordinate throughout the design and construction process. This coordination should help ensure that fiber installation does not negatively impact SWB's in-ground infrastructure and to ensure that the installation of SWB infrastructure does not negatively impact the fiber network.

ITI also may be able to install aerial fiber on some of SWB's above ground infrastructure such as pumps. Furthermore, ITI should consider SWB as a potential customer for an institutional network because SWB could utilize fiber to run environmental sensors to provide the real-time data it needs to more effectively manage its systems.

In addition to local public agencies like the Sewerage and Water Board, ITI should consider collaborating with other entities whose locations could be used to host network infrastructure or that could be potential customers. These entities include interested non-profits such as the DDD, school boards, courts, the sheriff's office, incumbent telecoms, Entergy, and community anchor institutions like hospitals and universities as listed above.

For example, if Entergy allowed the City to install fiber in its right-of-way, Entergy could use that fiber to implement money saving smart grid technologies. In this manner, Entergy could help the City build its network while receiving a valuable service from the City.

The City also may be able to collaborate with for profit and non-profit organizations that may be interested in sharing the construction and maintenance costs of a fiber network to gain access to low-cost, high-speed internet. Other possible collaborators include:

- Social service organizations
- Philanthropies
- Business incubators, especially those that seek to foster technology
- Digital media firms

If the City decided to pursue this option, it could develop a template "shared network policy" agreement to use as starting point for developing such partnerships.



## Telecommunications Organizations

Likewise the City could attempt to establish partnerships with New Orleans' incumbent telecom providers. However, if such efforts are unsuccessful (as they were for many other communities), the City could consider working with other actors in the telecom industry, a few of which are listed below.

- **360networks** owns a 1,011 mile fiber route from New Orleans to Chicago, IL,<sup>39</sup> which the City may be able to use for middle mile access.
- **Allied Fiber** provides a national, open access, physical layer, network neutral dark fiber superstructure with a connection to the US's international subsea cable landing points and intermediate access along the route to connect local networks to the global network.<sup>40</sup> Allied Fiber serves all business users on an approximately 12,000 mile nationwide network.<sup>41</sup> Customers can manage their latency requirements through placement of their electronics on the fiber.<sup>42</sup> The City can consider using Allied Fiber for connections to the larger internet.

## Regional, State and Federal Agencies

Regional, state, and federal agencies with offices in New Orleans also are potential customers and/or partners in an institutional fiber network. The City could expand the initial network to provide them with broadband in the future. If that's not possible, the City may be able to leverage buildings owned by these organizations to host network infrastructure. Below is a non-exhaustive list of regional, state, and federal agencies that could be partners in the institutional network.

- LaNet
- Louisiana Optical Network Initiative (LONI)
- Louisiana State Court of Appeal
- Louisiana State Child Protection
- Louisiana Vital Records Office
- Louisiana State Police
- Louisiana Air National Guard
- Old U.S. Mint
- Harbor Police
- United States Small Business Administration (SBA)
- United States Department of Housing and Urban Development (HUD)
- United States Department of Veterans Affairs (VA)
- United States Social Security Administration (SSA)
- United States Equal Employment Opportunity Commission (EOC)
- Federal Bureau of Investigations (FBI)
- United States Post Office (USPS)
- United States District Court (Eastern District) - Federal
- United States Court of Appeals for the Fifth Circuit - Federal
- General Service Administration (GSA) as stewards New Orleans' U.S. Customs House
- United States Immigration and Customs Enforcement (ICE)

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<sup>39</sup> 360networks inc. BTOP and BIP funding application.

<sup>40</sup> Allied Fiber website, <http://www.alliedfiber.com/> (accessed July 11, 2014).

<sup>41</sup> Stacey Higginbottom, "With Bandwidth Demand Booming, a New Kind of Optical Network Is Born," May 24, 2010, <http://gigaom.com/2010/05/24/with-bandwidth-demand-booming-a-new-kind-of-optical-network-is-born/>.

<sup>42</sup> Allied Fiber website, <http://www.alliedfiber.com/network.php> (accessed July 11, 2014).

- United States Department of Labor
- United States Maritime Administration (MARAD)
- United States Minority Business Development Agency (MBDA)
- Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)
- North American Aerospace Defense Command (NORAD)
- United States Department of Homeland Security (DHS)
- United States Coast Guard
- Federal Emergency Management Agency (FEMA)
- United States Army Corps of Engineers (USACE)

In one example of potential partnership, the City could research the feasibility of utilizing LaNet, an intrastate internet service provider that offers Louisiana's political subdivisions and educational institutions discounted service. Because LaNet does not guarantee a specific level of service, the City could not deploy critical functions on the network. However, it may be possible for the City to use LaNet to augment service to educational facilities, thereby reducing costs and/or improving redundancy. As of December 2013, the City of New Orleans was not listed among the LaNet users accessing the network via the New Orleans network operations center at LSU Health Sciences Center.<sup>434445</sup>

Likewise, the City could examine the feasibility of leveraging the Louisiana Optical Network Initiative (LONI), an intrastate high speed network for higher education. Because LONI only serves higher education and research institutions, the City could not utilize the network. However, it could encourage eligible local institutions that are not members, such as Loyola University, to consider connecting. Also, there may be limited opportunity for K-12 schools to use LONI. For more information, visit <http://www.loni.org/>.

## Project Champions

In addition to considering the benefits of collaborating with other entities as described above, the City also may consider cultivating relationships with people and organizations outside of government who can external champions of the institutional fiber network. The City will need these allies to help explain the potential benefits of an institutional network to people who may oppose the network.

**Local Champions:** In addition to non-profits and philanthropies, possible champions include other local entities that recognize the importance of adequate broadband access. Possible champions include:

- **WWOZ** – WWOZ, New Orleans' non-profit, community supported radio station, was one of the city's early adopters of digital technology.<sup>46</sup> Due to their history with digital technology and public service mission, they may support efforts to expand broadband availability and adoption.
- **Wells Fargo Bank** – Wells Fargo's NeighborhoodLIFT program helps people earning less than 120% of the area median income (~\$70,550 for a family of four in New Orleans) purchase a residence. NeighborhoodLIFT offers homebuyer education and \$15,000 in down payment

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<sup>43</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pg. 4.

<sup>44</sup> LaNet website: <http://doa.louisiana.gov/otm/lanet/>, accessed December 2013.

<sup>45</sup> LaNet website: [http://doa.louisiana.gov/otm/lanet/lanetmap\\_files/lanetsub.html#nor](http://doa.louisiana.gov/otm/lanet/lanetmap_files/lanetsub.html#nor), accessed December 2013.

<sup>46</sup> Conversation with David Freedman, WWOZ General Manager, June 24, 2013.

assistance.<sup>47</sup> Existing programs like NeighborhoodLIFT offer opportunities to expose low and moderate income New Orleanians to digital tools. For example, it may be possible for NeighborhoodLIFT to incorporate web-based modules and/or introduce class participants to internet tools to help them manage their finances and the home buying process.

**Regional, State, National, and International Champions:** The City also should work with regional, state, national, and international organizations interested in supporting the adoption of high-speed broadband. These organizations can provide access to research, industry experts, and peers in other communities who developed and enacted plans to address their broadband goals. Because many communities have built institutional networks (as detailed in the report “**Broadband Around the World**”), New Orleans should utilize their collective wisdom as it plans to build its own institutional network. Below is a non-exhaustive list of such potentially useful organizations.

- **Louisiana Broadband Advisory Council** - The 24-member Louisiana Broadband Advisory Council, created by [R.S. 51:955.3](#), exists to guide state leaders toward the ultimate goal of providing broadband access to all of Louisiana's citizens.<sup>48</sup>
- **Next Century Cities (NCC)** – NCC is a collaboration of individuals and communities dedicated promoting the idea that all Americans deserve access to fast, affordable, and reliable internet. NCC educates the public and elected officials about the importance of broadband, typical barriers to broadband access, and strategies to overcome those barriers.<sup>49</sup>
- **Institute of Electrical and Electronics Engineers (IEEE)** – IEEE recommends the US eliminate anti-competitive legal and regulatory challenges to the deployment of end-user owned networks and that the US give municipalities that deploy gigabit networks broader access to programs like the Rural Utility Service and the Universal Service Fund.<sup>50</sup> IEEE can serve as a resource for information about efforts to change telecom regulations.
- **National Association of Telecommunications Officers and Advisors (NATOA)** – NATOA sponsors a Lobby Day on Capitol Hill. The City could work with other municipalities to speak with Congress persons about broadband's importance and how state and federal laws impact a municipality's ability to acquire the high-speed broadband residents and businesses need.
- **American Planning Association (APA)** – APA's Planners Day on Capitol Hill encourages planners to discuss community needs with Congressional representatives. New Orleans could work with other municipalities to speak with Congress persons about broadband's importance and how state and federal laws impact a municipality's ability to acquire the high-speed broadband residents and businesses need. Events like APA's Planners Day on Capitol Hill and NATOA's Lobby Day support **Strategy 6: Educate the Public and Elected Officials about Broadband**.
- **Other States:** The City could advocate that the Universal Service Fund, which helps broadband providers offer reduced rates to low income rural residents, be expanded to allow states to use USF money to serve non-rural low income residents. Possible allies include Connecticut, which wants to expand broadband access to low income residents but cannot take advantage of the USF because it does not have designated rural areas.

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<sup>47</sup> Wells Fargo website: <https://www.wellsfargo.com/mortgage/lift/neighborhood> and <http://www.hope-ec.org/index.php/housing/new-orleans-neighborhoodlift-overview>.

<sup>48</sup> Louisiana Broadband Advisory Council website, [http://broadband.louisiana.gov/lbi\\_Council.asp](http://broadband.louisiana.gov/lbi_Council.asp) (accessed November 14, 2014).

<sup>49</sup> Next Century Cities website, <http://nextcenturycities.org/about-ncc/> (accessed November 14, 2014).

<sup>50</sup> Jim Baller and Casey Lide, “The Case for Public Fiber-to-the-User Systems,” March 4, 2006, pg. 7.

## **Partnership Agreements**

Project partners can provide the City with different types of support, including but not limited to, public support or advocacy for a project, money, professional or technical expertise, donated resources, and/or participation in network deployment and operations. Both local and national organizations likely will be interested in assisting the City in implementing portions of the Broadband Master Plan.

The City may want to develop text specific to the Broadband Master Plan for insertion into a Cooperative Endeavor Agreement, the contract the City signs with entities that wish to donate goods, money, or services to the City. The availability of boilerplate text may reduce the amount of time to negotiate a CEA with organizations and allow the City to access donated items sooner.

# APPENDIX D

## Grant Funding Sources

Project staff researched grant programs that could be possible funding sources to pay for a fiber network. Due to a lack of physical broadband infrastructure in rural areas compared to urban areas, most grant makers focus on helping rural communities. Therefore, the list of possible grant funding sources identified for New Orleans is short.

The City would need to evaluate the stipulations attached to grants it considers. Some grants may involve provisions so onerous that the City would deem the grant not worth the effort for the amount of money involved. Therefore, it is possible that the City may not find acceptable grant funding options and will not be able to use this funding option. Furthermore, even if the City found attractive grant options, there is always the possibility that the City may not receive the grant.

**Broadband Technology Opportunities Program (BTOP):** The American Recovery and Reinvestment Act provided the Department of Commerce’s National Telecommunications and Information Administration (NTIA) and the U.S. Department of Agriculture’s Rural Utilities Service (RUS) with \$7.2 billion to expand broadband access in the United States. Of those funds, the Act provided \$4.7 billion to NTIA to support the deployment of broadband infrastructure, enhance and expand public computer centers, encourage sustainable adoption of broadband service, and develop and maintain a nationwide public map of broadband service capability and availability.<sup>51</sup>

As of February 2013, 221 of 233 projects awarded BTOP grants were near completion. Projects focused on many goals, including extending middle mile networks, expanding high-speed networks to community anchor institutions (CAIs), and helping consumers subscribe to broadband.<sup>52</sup> In a letter complimenting BTOP, the Schools, Health & Libraries Broadband Coalition praised BTOP for recognizing that CAIs like schools, libraries, and medical facilities often:

- Serve multiple users and devices simultaneously and therefore require more bandwidth (100 mbps to 1 gbps or more) than residences
- Require affordable rates and redundancy (especially public safety organizations)<sup>53</sup>

If this program were re-authorized, the City should consider seeking funding given its flexibility in paying for different types of projects.

**Community Development Block Grant program:** The CDBG program can fund activities that meet one of three national objectives – benefit to low- and moderate-income persons, elimination of slums/blight, and urgent need.<sup>54</sup>

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<sup>51</sup> Broadband USA website: <http://www2.ntia.doc.gov/about>, accessed August 27, 2014.

<sup>52</sup> Schools, Health & Libraries Broadband Coalition’s Letter to the U.S. House Committee on Energy and Commerce, Subcommittee on Communications and Technology, February 26, 2013, pg. 2.

<sup>53</sup> Schools, Health & Libraries Broadband Coalition’s Letter to the U.S. House Committee on Energy and Commerce, Subcommittee on Communications and Technology, February 26, 2013.

<sup>54</sup> HUD Exchange, <https://www.hudexchange.info/cdbg-entitlement/fags/#?topic=Broadband%20Infrastructure&id=8C7CE694-1800-43B8-812FDC9299301E85>, accessed January 14, 2016.

The program defines public facilities and public improvements as facilities and improvements owned by public sector or facilities and improvements owned by nonprofit entities that are open to the general public.<sup>55</sup>

The CDBG program funds construction or installation of public (as defined above) infrastructure, including but not limited to streets, curbs, and water and sewer lines.<sup>56</sup>

In January 2016, HUD issued a response to frequently asked questions that clarified that CDBG funds may be used to install wiring, fiber optic cables, and permanently affixed equipment such as receivers for areas to receive broadband/internet access.<sup>57</sup> Eligible activities include:

- The acquisition, construction, reconstruction, rehabilitation, or installation of public facilities and improvements (which include infrastructure improvements) under 24 CFR 570.201(c).<sup>58</sup>
- The acquisition, construction, reconstruction, rehabilitation, or installation of distribution lines and facilities of privately-owned utilities, which includes the placing underground of new or existing distribution facilities and lines under 24 CFR 570.201(l).<sup>59</sup> A privately-owned utility refers to service that is publicly regulated and provided through the use of physical distribution lines to private properties. Utilities include, but are not limited to, electricity, telephone, water, sewer, natural gas, and cable television.<sup>60</sup>
- Digital literacy classes as a public service under 24 CFR 570.201(e).<sup>61</sup>
- Subsidizing the cost of internet service on behalf of an individual or family who cannot afford the cost as a public service (eligible, but not necessarily feasible).<sup>62</sup>

CDBG funds may be used by grantees and sub-recipients.

**Connect America Fund:** Since 2012, the Connect America Fund has distributed \$4.5 billion to support voice and broadband capable networks with the ultimate goal being universal availability to homes, businesses, and community anchor institutions.<sup>63</sup> The Connect America Fund is part of efforts to reform the Universal Service Fund, which subsidizes carriers to serve high-cost areas.<sup>64</sup> Although the Connect America Fund typically supports rural telecom networks, it may be possible to use these funds in urban areas because the program serves “high cost” areas<sup>65</sup> rather than rural areas, per se.

**Delta Regional Authority:** The Delta Regional Authority, which serves counties and parishes in 8 states, has an iDelta initiative to expand broadband access. Although their focus seems to be rural areas, New Orleans may be able to get funding for network from them because Orleans Parish is part of their service area. For more information, visit <http://www.dra.gov/initiatives/idelta.aspx>.

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<sup>55</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007 – pg. 6-1.

<sup>56</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007 – pg 6-1.

<sup>57</sup> HUD Exchange, accessed January 14, 2016.

<sup>58</sup> HUD Exchange, accessed January 14, 2016.

<sup>59</sup> HUD Exchange, accessed January 14, 2016.

<sup>60</sup> Basically CDBG, HUD Office of Block Grant Assistance, November 2007 – pg. 6-6.

<sup>61</sup> HUD Exchange, accessed January 14, 2016.

<sup>62</sup> HUD Exchange, accessed January 14, 2016.

<sup>63</sup> “Telecommunications: Federal Broadband Deployment Programs and Small Business,” GAO-14-203, US General Accountability Office, February 2014, pg. 7.

<sup>64</sup> “Telecommunications: Federal Broadband Deployment Programs and Small Business,” GAO-14-203, US General Accountability Office, February 2014, pg. 7.

<sup>65</sup> “Telecommunications: Federal Broadband Deployment Programs and Small Business,” GAO-14-203, US General Accountability Office, February 2014, pg. 9.

**Economic Adjustment Assistance:** This program addresses the needs of distressed communities experiencing sudden or gradual adverse economic changes that generally result from industrial or corporate restructuring, new Federal laws or requirements, reduction in defense expenditures, depletion of natural resources, or natural disaster.

Economic Adjustment Assistance grants are intended to enhance a distressed community's ability to compete economically by stimulating private investment in targeted areas. Current investment priorities include proposals that focus on (a) Collaborative Regional Innovation, (b) Public/Private Partnerships, (c) National Strategic Priorities, (d) Global Competitiveness, (e) Environmentally-Sustainable Development, and (f) Economically Distressed and Underserved Communities.

While this program does not focus on broadband, applicants may be able to obtain funding if they can show a rational nexus between investment in broadband and the program priorities. Applicants could argue that broadband investment would support environmentally sustainable development and assisting economically distressed and underserved communities. For more information on these investment priorities and current funding opportunities, go to <http://www.eda.gov>.

**Federal Universal Service Fund (E-Rate Program):** The Federal Communication Commission oversees the E-Rate program, which is part of the federal Universal Service Fund. As of February 2014, the Obama Administration planned to double the amount of money for deploying high-speed internet to schools and libraries to \$2B per year. The E-Rate program also aims to increase bandwidth and provide wireless networks in schools. The target is to give all schools 100 Mbps service by 2015 and 1 Gbps service by 2020.<sup>66</sup> The City could investigate the feasibility of using these funds to provide service to K-12 schools and libraries, which could allow the City to use other funds to build other parts of the network.

**Louisiana Universal Service Fund:** State Universal Service Funds (USFs) support telecom service to high cost areas, low-income residents, and other consumers whom it is unprofitable for telecoms to serve. USFs must meet the needs of state residents and telecom carriers. As of July 2012, only 4 of the 43 states with a USF specifically dedicated money to broadband service.<sup>67</sup> Louisiana was not one of the 4; it supports only a high-cost fund to bring telecom service to areas that are expensive to serve.<sup>68</sup>

In Louisiana, ILECs, CLECs, IXCs, wireless providers, interconnected VOIP providers, and end users contribute to the state USF based on total gross state retail revenue; paging providers do not contribute.<sup>69</sup> For the 2011-12 fiscal year, Louisiana collected \$45.4 M for its high-cost fund; the state collected nothing for broadband.<sup>70</sup>

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<sup>66</sup> "FCC Says It Will Double Spending on High-Speed Internet in Schools and Libraries," New York Times, Edward Wyatt, February 1, 2014, <http://mobile.nytimes.com/2014/02/02/us/fcc-says-it-will-double-spending-on-high-speed-internet-in-schools-and-libraries.html?referrer> (accessed February 2014).

<sup>67</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pg. iv-v, 1.

<sup>68</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pg. 6.

<sup>69</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pp. 7-8, 59.

<sup>70</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pp. 52-3.



Due to the 2011 FCC USF/ICC Transformation Order, the federal USF may reduce the amount of support it provides to state USFs.<sup>71</sup> As of July 2012, it appeared that Louisiana was considering changes to its USF to address the Transformation Order.<sup>72</sup> Because Louisiana collects approximately \$40M annually, there may be an opportunity to use some of that money for broadband in the future.

To raise money for broadband via its USF, Louisiana could charge a one-time fee on the purchase of digital devices in-person and via the internet. The fee should be affordable to avoid discouraging sale of network devices, which would undermine the goal of broadband expansion.<sup>73</sup>

Universal service has been a goal of American communications policy since the establishment of the United States Postal Service. The USPS achieved near ubiquitous access by subsidizing post roads and post offices in remote areas with profitable, heavily used routes.<sup>74</sup> Given the government's long history of promoting cross-subsidization in US communications services, first with postal service, then with telephone, radio, and television, and now on a limited basis with internet, there is a strong precedent to increase the use of USF to improve broadband in poorly served areas.

**First Responder Network Authority (FirstNet):** is an independent authority within the U.S. Commerce Department's National Telecommunications and Information Administration. Its mission is to build a nationwide, wireless broadband network for public safety.

Because public safety personnel would use an institutional fiber network, the City might consider pursuing grants dedicated to public safety networks to fund part of construction costs. Likewise, the City could pursue funds for wireless networks to pay for complementary wireless service for first responders.

#### **Contact Information**

12201 Sunrise Valley Drive  
Mail Stop 243  
Reston, VA 20192  
703-648-4146

Boulder, CO Technical Headquarters:  
3122 Sterling Circle Boulder, CO 80302

[info@firstnet.gov](mailto:info@firstnet.gov)  
[www.commerce.gov](http://www.commerce.gov)  
[www.ntia.doc.gov](http://www.ntia.doc.gov)

**Global Climate Change Mitigation Incentive Fund:** This program seeks to advance the green economy in distressed communities. It supports projects that create jobs through, and increase private capital investment in, efforts to limit the nation's dependence on fossil fuels, enhance energy efficiency, curb greenhouse gas emissions and protect natural systems. Eligible projects include green building construction, renewable energy development, greater energy efficiency, product reuse, and natural

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<sup>71</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pg. 6.

<sup>72</sup> "Survey of State Universal Service Funds 2012," National Regulatory Research Institute Report No. 12-10, Sherry Lichtenberg, Ph.D., Kafui Akyea, Phyllis Bernt, Ph.D., July 2012, pg. 82.

<sup>73</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pp. 5-6.

<sup>74</sup> "Toward a Broadband Public Interest Standard," American University Washington College of Law, Anthony E. Varona, 2009, pg. 78.



resource restoration that result in a green end-product, the greening of an existing function or process, or a third-party certified green building.

This program does not focus on broadband; however, applicants may be able to fund broadband deployed as part of a project that would meet the program objectives outlined above.

**National Telecommunications & Information Administration (NTIA):** The NTIA supports the development of broadband networks. Please visit [http://www.broadband.la.gov/lbi\\_providers.asp](http://www.broadband.la.gov/lbi_providers.asp) for submission guidelines. Submissions must include network information as summarized in the following table.

Required Information for NTIA Grant Submissions <sup>75</sup>		
Network Data	Middle Mile Data	Community Anchor Institutions
Coverage area map	911 addresses or X,Y coordinates for network elements	Anchor name
Provider name	Elevation relative to grade	911 addresses or X,Y coordinates for network elements
DBA name	Provider name	Category - K-12 schools, libraries, healthcare, public safety, post secondary schools, government and non-government community support
Technology used	DBA name	Broadband subscription status
Maximum upload speed	FCC registration number	Technology available
Maximum download speed	Facility ownership	Upload speed
Typical upload speed	Facility capacity	Download speed
Typical download speed	Facility type	

**United States Economic Development Administration (EDA):** EDA's mission is to lead the federal economic development agenda by promoting innovation and competitiveness by preparing American regions for growth and success in the worldwide economy. EDA encourages programs that promote job growth and business expansion in today's technologies and in discovering tomorrow's. EDA programs that potentially could support aspects of the Broadband Master Plan are listed below.

- **Public Works and Economic Development** - Supports the construction, expansion or upgrade of essential public infrastructure and facilities.
- **Economic Adjustment Assistance (EAA)** - Provides a wide range of technical, planning, and public works and infrastructure assistance in regions experiencing adverse economic changes (e.g., strategy development, infrastructure construction, revolving loan fund capitalization).
- **Planning** - Assists local and regional organizations (District Organizations, Indian Tribes, and other eligible entities) with their short- and long-term planning efforts.
- **Global Climate Change Mitigation Incentive Fund** - From amounts otherwise made available for the economic development assistance programs authorized by PWEDA, promotes EDA policies and strategies which contribute to environmentally sustainable development.
- **EDA i6 Challenge** - The i6 Green Challenge focuses on the nexus between economic development and environmental quality and rewards innovative, ground-breaking ideas that enable technology commercialization, new venture formation, job creation, and economic growth.

For more information, visit

<http://www.eda.gov/>

[http://broadband.louisiana.gov/lbi\\_funding\\_EDA.asp](http://broadband.louisiana.gov/lbi_funding_EDA.asp)

**Federal Grants:** For information about grant funding available from the United States government, please visit <http://www.grants.gov/>.

<sup>75</sup> Louisiana Broadband Mapping Program Quick Start Guide for Wireline Providers: January – June 2013.

## Private and Philanthropic Grant Funding Sources

In addition to the government initiatives listed above, private foundations and corporations also offer grant funding. This section provides information about grant-making philanthropic organizations.

**GuideStar:** GuideStar provides information about 1.8 million tax-exempt organizations that are possible funding sources for a project. Available information includes:

- Address, phone number, website, contact info
- Current year revenue and expense data
- Balance sheets (up to 5 years)
- Form 990 (up to 3 years) - provides details on an organization's giving levels
- Annual reports
- Listing of CEO, board chair, and board members

For more information, visit <http://www.guidestar.org/>.

**Foundation Center:** The Foundation Center gathers information about philanthropic organizations. It maintains a comprehensive database of U.S. and global grantmakers and their grants. This includes traditional philanthropies and corporate philanthropic entities. It also operates research, education, and training programs designed to advance knowledge of philanthropy at every level. Services include:

- Library/learning centers with free access to information resources and educational programs in 5 locations — New York City; Washington, DC; Atlanta; Cleveland; and San Francisco.
- Unique databases of information on more than 108,000 foundations, corporate donors, and grantmaking public charities in the U.S. and over 3 million of their recent grants. The *Foundation Directory Online* subscription service facilitates searching these databases.
- Website with free search tools, tutorials, downloadable reports, and other information, including *Philanthropy News Digest*, its daily news service, and *IssueLab*, its searchable online collection of more than 12,000 documents representing one of the largest collections of social sector knowledge.
- Classroom and online training courses on the funding research process, proposal writing, grantmakers and their giving, and related topics.
- Coordinating a global Funding Information Network — 470+ locations that offer free local access to core Center resources and training.

For more information, visit <http://foundationcenter.org/>.

**Bill and Melinda Gates Foundation** — This foundation does not fund the following types of projects:

- Direct donations or grants to individuals
- Projects addressing health problems in developed countries
- Political campaigns and legislative lobbying efforts
- Building or capital campaigns
- Projects that exclusively serve religious purposes<sup>76</sup>

Therefore, the City could not seek funding for fiber network construction. However, the City could seek funding for digital literacy training or other aspects of the Broadband Master Plan. For more information, visit <http://www.gatesfoundation.org>.

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<sup>76</sup> Bill & Melinda Gates Foundation, <http://www.gatesfoundation.org/How-We-Work/General-Information/What-We-Do-Not-Fund>, accessed August 27, 2014.

**Corporations:** Corporations also are a potential funding source to help pay for portions of the Broadband Master Plan. Corporations sometimes donate money and other support directly; marketing budgets may include money to fund community benefit projects. Often corporations channel donations and other support through their foundations.

The following corporations have traditionally donated large sums of money to various causes.

- Wal-Mart Stores
- Goldmand Sachs Group
- ExxonMobil Corporation
- Wells Fargo & Company
- Chevron
- Bank of America
- JPMorgan Chase and Company
- Target Corporation
- General Electric Company
- Citigroup

**Other Funding Sources** include:

- Professional Societies
- Trade Associations
- Labor Unions
- Cultural and Religious Organizations

With soliciting support, it is important to remember that organizations that cannot provide direct funding, may be able to offer other types of in-kind support like expertise, supplies, use of facilities, etc.

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# APPENDIX E

## Other Funding Sources

In addition to grants and donations, the City could consider other mechanisms to generate support for different strategies in the Broadband Master Plan.

**RE.invest Initiative:** Since 2013, the City has worked with re.focus partners to develop a plan to entice sustainable and resilient technology firms that need to test new products in a realistic environment to select New Orleans as a demonstration site. Thus far, the City has selected the Lafitte Greenway, the Claiborne Corridor, and vacant lots throughout New Orleans as appropriate for demonstration projects.

Ideally, firms would pay the City for the opportunity to test their products in New Orleans and the City could use some of the money to pay for portions of the Broadband Master Plan and other projects the City is pursuing. In addition, the City might be able to acquire sustainable and resilient products if demonstrators and the City negotiate to allow the City to retain the installed equipment. The next step is for the City and re.focus to begin attracting product demonstrators to New Orleans.

**Strategic Partnerships:** The City should consider partnerships with organizations whose presence on the network could benefit the project. For example, the participation of the Orleans Parish School Board and/or the Recovery School District might release federal e-rate funds, which are used to help schools with a large number of low income students, to pay for a portion of construction costs.

Likewise, the City could work with its public housing agency, the New Orleans Redevelopment Authority (NORA). NORA could require fiber connections in all new affordable housing units to facilitate future broadband access. In the near-term, the City could provide broadband to nearby facilities open to the general public.

Recent projects to expand broadband access have attempted to address the broadband needs of public housing residents. For example, Google Fiber and the Housing Authority of the City of Austin (HACA) inked a deal for Google to offer free 5Mbps service to the city's 4,300 public housing residents for 10 years. Google also plans to provide computers to HACA training centers and to fund digital literacy training through Austin Free-Net, a local non-profit.<sup>77</sup>

**Revenue Generation via Channel Leasing:** Community owned fiber networks may include approximately 100,000 high definition channels which could be leased to businesses, which could use the channels for marketing. This option offers community-owned networks another form of revenue.

**Revenue Generation via Cell Site Leasing:** Municipalities also may consider leasing space on municipally owned buildings and utility poles to telecoms and using the revenue to pay for building municipally owned broadband infrastructure. Asset value depends on access to the broadband network and proximity to end users.<sup>78</sup> As of fall 2013, municipalities could generate \$18K to \$24K per year.<sup>79</sup>

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<sup>77</sup> Emil Protalinski, "Google Fiber promises Austin's public housing residents free 5Mbps Internet for 10 years," VB News, November 20, 2014, <http://venturebeat.com/2014/11/20/google-fiber-promises-austins-public-housing-residents-free-5mbps-internet-for-10-years/>.

<sup>78</sup> "Asset Mapping Catalyzes Broadband Development," Broadband Communities, November/December 2013, Brian Mefford, pg. 99.

## Crowdfunding

Crowdfunding is the practice of paying for a project or venture by raising money from a large number of people – usually via the internet. **Rewards crowdfunding** allows an entrepreneur to pre-sell a product or service to test a business concept without incurring debt or selling equity. It has been used to support motion picture production, software development, scientific research, and civic projects. **Equity crowdfunding** allow an entrepreneur to sell shares in his/her company during early stages in exchange for money pledges.<sup>80</sup>

As of 2012, there were more than 450 crowdfunding platforms. Therefore, project creators need to conduct appropriate research to understand which platform is the best choice for the project they wish to launch.<sup>81</sup> Some platforms seem particularly suited to civic projects; some of these are described below.

**GlobalGiving:** funds a range of civic projects aimed at improving education, ending hunger, providing shelter, and teaching job and life skills. GlobalGiving's charity fundraising web site allows social entrepreneurs and non-profits worldwide to raise the money to improve their communities.<sup>82</sup>

Since 2002, GlobalGiving has raised \$175,629,615 from 458,266 donors who have supported 12,140 projects. The site allows donors to select projects to support, make a tax-deductible contribution, and receive email updates from the project to understand how your gift is making a difference.<sup>83</sup> GlobalGiving seems like a possible source of funds for digital literacy education projects.

**Kickstarter:** allows people to raise money for creative projects across a range of categories. Potentially useful for the City in its efforts to implement various projects in the Broadband Master Plan is the fact that Kickstarter includes technology projects among its project categories. As of May 2015, \$291M had been pledged to 2,855 technology projects.

For more information, visit Kickstarter's website: <https://www.kickstarter.com/>.

**Citizeninvestor:** is a crowdsourcing and crowdfunding site for local government projects focused on art/culture, athletic facilities, community grants, educational facilities, libraries, neighborhood improvements, parks, sustainability/energy savings, transit/transportation, and walkability/bike safety.

For more information, visit the Citizeninvestor website: <http://www.citizeninvestor.com/>.

**GoFundMe:** allows people to fund many types of projects in multiple locations. For more information, visit <http://www.gofundme.com/>.

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<sup>79</sup> "Asset Mapping Catalyzes Broadband Development," Broadband Communities, November/December 2013, Brian Mefford, pg. 100.

<sup>80</sup> Wikipedia - <http://en.wikipedia.org/wiki/Crowdfunding>: accessed May 13, 2015.

<sup>81</sup> Wikipedia - <http://en.wikipedia.org/wiki/Crowdfunding>: accessed May 13, 2015.

<sup>82</sup> GlobalGiving website: <http://www.globalgiving.org/aboutus/>: accessed May 13, 2015.

<sup>83</sup> GlobalGiving website: <http://www.globalgiving.org/aboutus/>: accessed May 13, 2015.

**Spacehive:** is a British site that allows users to suggest a civic project and then raise money to implement the project. For more information, visit <https://spacehive.com/>.

**Change by Us:** allows people to share ideas, do projects, and improve cities. Currently, Change by Us focuses on New York, Phoenix, and Philadelphia. For more information, visit <http://changeby.us/>.

A quick perusal of the crowdfunding websites listed above suggests that GlobalGiving, Kickstarter, and Citizinvestor could be useful for community organizations seeking to raise funds for certain projects included in the New Orleans Broadband Master Plan e.g.) providing digital literacy education. The fact that users raise funds for a wide variety of projects via these websites results in the opportunity for a project to be reviewed and considered by a large number of people.

On the other hand, Spacehive and Change By Us focus on funding civic projects aimed at improving a community. The specialized nature these sites may limit the number of potential funders who see a project. Currently, the fact that one cannot fund projects in New Orleans via these two websites makes them unusable. If these sites were to include New Orleans, it may be worthwhile for New Orleans community organizations offering digital education and other broadband services to raise funds via these sites as well.

**ioby (In Our Back Yards):** ioby provides a platform that gives people the ability to organize cash, social networks, in-kind donations, volunteer time, and advocacy in support of specific projects in their neighborhood. On ioby, users start a project and then solicit their neighbors for support to complete the project. While ioby's platform allows people anywhere to propose a project, ioby staffers learned that ioby works best when they work closely with people and organizations who have deep local roots. As of 2016, ioby works intensively with New York City, Detroit, Cleveland, Washington, DC, and Pittsburgh. For more information, visit <https://www.ioby.org/>.



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# APPENDIX F

## Resources for Construction Cost Estimate Preparation

Because the Broadband Master Plan includes the construction of an institutional fiber network, project staff gathered information about fiber network construction costs to help City staff learn about various factors that impact the cost of building a FTTP network.

This section contains data about the cost of products and services needed to build a fiber network. The data are not New Orleans specific.

Typically, broadband providers install fiber in two locations – underground (aka in ground) or aerially.

### Underground Fiber Deployment

Underground fiber deployment involves four main tasks:

1. Digging the trench in which fiber gets placed
2. Installing the conduit that protects the fiber in the trench
3. Pulling or pushing the fiber through the conduit
4. Connecting the network to individual premises and to middle mile and long-haul fiber services

Each task involves the purchase of products for installation and the use of equipment and human labor to perform the work. Project staff performed a quick scan of the internet to gain a sense of the price range for fiber installation. The table below includes high-level costs quoted by fiber network designers on public internet fora while the subsequent sections provide costs for some of the specific components of fiber network construction.

Sample Fiber Costs <sup>84 85</sup>		
Type of Installation	Cost	Notes
Long haul – 2 conduits and 144 strands of fiber	\$175K / mile	Buried or using long-haul electrical transmission lines
FTTP in major metro city center (e.g. New York, San Francisco)	At least \$100K / block	Will have to overcome inconsistent regulations
FTTP in urban areas	\$100K / mile	Fiber = \$5K to \$15K per mile Conduit = \$5K to \$15K per mile
FTTP in major metro suburbs	\$20K / mile	Assumes aerial installation
FTTP in rural areas	\$30K / mile	

<sup>84</sup> Quora discussion thread, <http://www.quora.com/What-is-the-rule-of-thumb-in-estimating-the-cost-to-build-out-a-dark-fiber-run>, accessed April 9, 2015.

<sup>85</sup> “Launching Local Fiber to the Premise Networks Using JULIET (Joint Underground Location of Infrastructure for Electric and Telecommunications),” presentations by TeleDimensions, pg. 8.

**Digging/Trenching:** The cost to dig a trench for the fiber in its conduit varies considerably depending on the trenching technique used, the material being cut, and the terrain.

With cut and cover, workers dig a linear trench, insert conduit and fiber, and cover the conduit and its trench with soil. This method is often used in unpaved areas. With directional boring, workers dig holes at each end of the proposed fiber's linear path. Then, they insert a boring machine in one hole. The machine will drill a horizontal underground path into which workers can install fiber inside of conduit. Once the machine reaches the terminus, workers remove it via the second hole. This technique may be preferential when installing fiber underneath paved surfaces to minimize the amount of damaged pavement that must be replaced.

Additionally, fiber installation costs vary due to terrain; installation in mountainous areas typically is more expensive. This may be due to rocky soils and/or the need for more digging to accommodate significant changes in grade along the fiber route. The table below shows trenching costs for Missoula, MT, a mountainous region.

<b>Trenching Costs – Missoula, MT<sup>86</sup></b>	
<b>Trenching Method</b>	<b>Cost per Linear Foot</b>
Directional bore placement	\$80 to \$150
Trenching placement methods	\$50 to \$80

Fiber installation costs in damp areas with poor drainage also may be greater due to the need to use fiber and conduit that can withstand humid conditions.

A significant share of the cost of in-ground fiber deployment is the cost of trenching and street repair as shown by the following comparison of the cost of conduit and the total cost of conduit installation associated with the deployment of a fiber network in Santa Monica, CA.

<b>Conduit Costs<sup>87</sup></b>	
<b>Trenching Method</b>	<b>Cost per Mile</b>
Conduit only	\$2K to \$9K
Conduit installation with digging and street repair	\$15K to \$100K

### **Aerial Fiber Deployment**

Aerial fiber deployment usually involves stringing aerial fiber between poles. Using existing poles is considerably cheaper than installing new poles as shown in the table below.

<b>Aerial Deployment Costs<sup>88</sup></b>	
<b>Method</b>	<b>Cost per Linear Foot</b>
Fiber deployment on existing poles	\$2 to \$4
Fiber deployment on new poles	\$20 to \$40

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<sup>86</sup> Magellan Advisors, "Next-Generation Broadband Feasibility Study" for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, July 16, 2014, pg. 50.

<sup>87</sup> Christopher Mitchell and Eric Lampland, "Santa Monica City Net – An Incremental Approach to Building a Fiber Optic Network," Institute for Local Self-Reliance, March 2014, pg. 12.

<sup>88</sup> "State and Local Government Role in Facilitating Access to Poles, Ducts, and Conduits in Public Rights-of-Way," FTTH Council Americas, August 2013, pg. 1.

## Other Costs

The table below contains information on a few of the other costs associated with fiber network deployment. Project staff will resume data collection on the cost of products and services needed to build a fiber network costs when the focus of the project becomes network design and construction.

Miscellaneous Costs <sup>89</sup>	
Method	Cost
30 kW AC backup generator	\$25K each
Development of detailed engineering drawings, preparation of applications for easements and permits	historically 10.4% of construction and equipment costs
Project management and project inspection	historically 9.2% of construction and equipment costs

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<sup>89</sup> Mid-Atlantic Broadband Cooperative BTOP Grant Request, EasyGrants Number 972, pg. 2, 3.

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# APPENDIX G

## Resources for Operations and Maintenance Cost Estimation

Because the Broadband Master Plan includes the operation of an institutional fiber network, project staff gathered information about fiber network operations and maintenance costs to help City staff learn about various factors that impact the cost of running a FTTP network.

This section contains data related to fiber network operations. The data are not New Orleans specific.

**Staffing:** A municipality that builds a community owned fiber network has two main options for network operations. The municipality can conduct all the daily operations and maintenance work with municipal employees or the municipality can hire a consultant to perform that work under the oversight of municipal employees.

Using municipal employees to handle all tasks provides the municipality with the greatest control over network operations. However, this model likely will require the municipality to hire new staff. Depending on the presence and extent of civil service hiring rules, it may take a long time to hire new staff through the municipality's usual methods. Additionally, the municipality may not want to provide civil service protections for the staff running its network. Therefore, for some municipalities, using municipal employees to run the network may not be an ideal choice.

On the other hand, using consultants provides less direct control, but may provide more flexibility. Municipal staff would be responsible for major decisions about the network, but would leave minor decisions to the consultant. In this manner, a municipality may avoid hiring direct employees through its civil service procedures. In some municipalities, it may be faster to procure staff to run the network via an RFP for a vendor than via civil service hiring procedures. In addition, the municipality may prefer to have the option of using outside vendors to ensure that it can always acquire staff with timely knowledge of the telecom industry and its products and services. It may be difficult for civil service staff to do that because their jobs don't evolve as quickly.

In reality, the decision about whether to use municipal employees (who may be subject to a civil service system) or hire consultants (who may be easier to fire, if their performance is less than stellar) is complex. Using employees may not preclude using consultants, too, and it is likely that many municipal networks can be operated by a combination of employees and consultants.

The table below provides information about the cost of typical tasks associated with operating and maintaining a fiber network.

<b>Cost Information for Fiber Network Operations and Maintenance<sup>90</sup></b>	
<b>Task</b>	<b>Staffing Needs / Cost</b>
<b>Physical infrastructure</b>	1 technician per 80 to 100 route miles of outside fiber plant
<b>Network operations center</b>	Staff monitor network conditions and ensure level of service, quality, and reliability.  Cost ranges from \$2K to \$20K per month depending on route miles, number of access points, number of connected users, user type and expectations, hours of support, and level of trouble shooting.
<b>Contract administrator</b>	Required on FTTP networks that offer high-end retail services like dark fiber and other specialized services.
<b>Other staff</b>	Field and support technicians 1 per 2000 customers to 1 per 3500 customers per shift.  Customer service representatives 1 per 2000 customers to 1 per 3500 customers per shift.
<b>Maintenance</b>	If done internally, this cost becomes a staffing expense.  Ongoing Expenses <ul style="list-style-type: none"> <li>• Locating and marking underground plant to avoid damage from future construction in the area</li> <li>• Pole attachment fees for aerial plant</li> </ul> Maintenance fees 15% or more of accrued investment
<b>Internet Connection</b>	The size of the data connection to the internet varies by the network's oversubscription rate and bandwidth sharing.  A warehouse may be able to share bandwidth with many users but a data intensive institution may require a dedicated amount of bandwidth for its exclusive use.  Price for backhaul <ul style="list-style-type: none"> <li>• Competitive markets &lt; \$1 per month per mbps of bandwidth</li> <li>• Less competitive markets \$80 per month per mbps of bandwidth</li> </ul>

<sup>90</sup> Ben Lennett, Patrick Lucey, Joanne Hovis, Andrew Afflerbach, Hibah Hussain, and Nick Russo in conjunction with New America's Open Technology Institute and CTC Technology and Energy, "The Art of the Possible: An Overview of Public Broadband Options," pg. 28-30.

<b>Cost Information for Fiber Network Operations and Maintenance<sup>91</sup></b>	
<b>Task</b>	<b>Staffing Needs / Cost</b>
<b>Billing</b>	<p>For data-only service, billing is relatively simple</p> <p>Costs is &lt; \$1 per month per subscriber</p> <p>Applicable only to FTTP networks that offer retail service</p>
<b>Bad debt</b>	<p>Some customers will not pay their bills.</p> <p>For most FTTP networks, the bad debt percentage ranges from &lt; 0.5% of revenue to &gt; 3% of revenue.</p> <p>Applicable only to FTTP networks that offer retail service</p>
<b>Churn</b>	<p>Some loss of customers will cancel service.</p> <p>Customer churn can range from a few percent per year to &gt; 1% per month.</p>
<b>Other Costs</b>	<ul style="list-style-type: none"> <li>• Indefeasible rights of use (IRU) @ \$500 to \$2500/fiber/mile</li> <li>• Collocation @ \$500 to \$1,200/rack/month + power</li> <li>• O&amp;M @ \$100 to \$300/route mile/year</li> <li>• Optronics to light the fiber – cost varies<sup>92</sup></li> </ul>

<sup>91</sup> Ben Lennett, Patrick Lucey, Joanne Hovis, Andrew Afflerbach, Hibah Hussain, and Nick Russo in conjunction with New America's Open Technology Institute and CTC Technology and Energy, "The Art of the Possible: An Overview of Public Broadband Options," pg. 28-30.

<sup>92</sup> "The Quilt's Regional Optical Network Workshops," Presentation in Albuquerque, NM, Joint Techs, February 6, 2006, [www.thequilt.net](http://www.thequilt.net), Slide 10.



# APPENDIX H

## Public Policy Recommendations

This appendix lists many policies to facilitate the construction and upgrade of fiber broadband networks. These policies focus on multiple issues affecting the deployment of broadband networks including:

- Governance and oversight of telecommunications issues
- Document control and standardization
- Creation of geo-databases to track property, construction, and events in public rights of way
- Policies governing all construction in public rights of way
- Methods to encourage fiber deployment

The design of some policies aims to entice incumbent ISPs to upgrade their networks or to entice new ISPs to serve New Orleans. Other policies should make it easier for any entity, including but not limited to ISPs, to build or expand a fiber network or upgrade a cable or DSL network to fiber.

Although each policy can help facilitate fiber network deployment by addressing a barrier to network deployment or upgrades, many of the policies can support each other. The enactment of multiple policies could eliminate or reduce enough barriers to make it feasible for incumbent ISPs or the City itself to deploy fiber networks within New Orleans. Assuming that existing ISPs would offer adequate bandwidth at reasonable prices, the deployment of FTTP networks by telecoms could provide New Orleanians with affordable, high-speed broadband at home.

If the City deploys a FTTP institutional network, New Orleanians would have access to high-speed fiber in publicly owned and operated facilities like community centers, libraries, and parks with the possibility of eventual service in their homes, if conversion of the institutional fiber network to a municipal fiber network were deemed feasible and necessary in the distant future.

# APPENDIX H

## Public Policy Recommendation 1: Create Broadband Oversight Committees

Due to the length of time needed to design and construct an institutional fiber network (at least 3 years and potentially longer) and implement programs to help lower income New Orleanians learn skills and acquire affordable broadband at home, the Broadband Master Plan will require many project champions to help bring it to fruition.

These champions need to be inside and outside of City government. Ideally, internal champions will be distributed across many departments and at all levels. Their input will be crucial to create policies that enable the City to implement the steps to build a fiber network in a cost effective manner and to work with other organizations to promote digital literacy education and affordable broadband access. In addition, internal champions inside City government could work with the Information Technology and Innovation department, to create Requests for Proposals for network design and construction services.

Project champions outside City government should be able to help project staff gather relevant information, connect with critical stakeholders, and solicit assistance from interested philanthropic partners. Partners outside City government also could assist with policy development and other tasks.

### Broadband Policy Development – City Staff Involvement

Municipal broadband experts typically suggest that cities designate a responsible person, agency, or committee of employees to guide broadband policy development and suggest ways to integrate broadband planning into policies, plans, procedures, and ordinances issued by other departments that do not carry the primary responsibility for broadband.<sup>93</sup> For example, broadband can be incorporated into the General Plan, Specific Plans, Redevelopment Agency Plans, Community Sustainability Plans, and Emergency Response Plans, among others.<sup>94</sup>

As currently contemplated, in New Orleans, the Information Technology and Innovation (ITI) department is leading efforts to improve broadband access for City staff and low income New Orleanians. Using data gathered during the research phase, ITI developed this Broadband Master Plan and should lead efforts to implement individual provisions of this Plan. Within the ITI department, primary responsibility for the Plan resides with the Broadband Project Manager who works under the oversight of the Chief Information Officer with assistance from other ITI staff as necessary.

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<sup>93</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 10.

<sup>94</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 13.

However, broadband project staff will require assistance from staff in other departments to create viable policies to:

- Integrate broadband into the daily work performed City employees.

For instance, the Safety and Permits department may want to eliminate the need for building inspectors to return to the office to enter data about the sites they inspect. The delay between inspection and data entry increases the time an inspector spends working on each property and may increase errors if inspectors misinterpret their notes when entering information later. Use of a mobile device and application developed to capture the critical information for later retrieval and analysis could help inspectors to do their jobs quicker with fewer errors. ITI would have to work with Safety and Permits to procure mobile devices, develop an application to allow remote data entry, and then train Safety and Permits staff to use the application.

- Utilize City operations to execute policies that foster broadband deployment and subscription.

For example, the City could expedite permit review or reduce permit fees to incent ISPs to provide a community benefit like installing fiber for City government's free and unlimited use or offering high bandwidth, affordable broadband to New Orleans' low income residents.

In summation, there are opportunities both to use broadband to improve City operations by making it easier for staff to perform their jobs and to use City operations to deploy policies to improve broadband.

Implementation of some policies may alter work for staff in other City departments. Therefore, they should be included in policy development to ensure that policies can achieve the desired objectives and to minimize impact on staff whose primary responsibility is not broadband development.

Project staff may be able to accomplish project goals by working with other staff on an as-needed basis or they may want to establish an **Employee Broadband Oversight Committee** with scheduled meetings to provide regular communication between project staff and employees in other departments.

## **Broadband Policy Development – Community Stakeholder Involvement**

The implementation of the Broadband Master Plan, especially digital literacy education and affordable broadband access for low income people, will require help from outside City government (e.g. non-profit organizations, large and small businesses, and residents). Assistance may be on an ad hoc basis or via a **Community Stakeholder Broadband Oversight Committee** to advise City staff on policy development and provide connections to targeted constituents.

The oversight committee should include people with a range of digital fluency and broadband access. In addition to the typical committee members, people associated with large businesses, the **Community Stakeholder Broadband Oversight Committee** should include small business owners and members of digitally disadvantaged socio-economic groups, even if they are not digitally disadvantaged personally. Ideally, the committee also should include individuals who lack digital fluency and people who recently became digitally literate. They can provide insight that people who have been using computers for decades may not be able to provide.<sup>95</sup>

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<sup>95</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 13.

# APPENDIX H

## Public Policy Recommendation 2: Document Control and Standardization

Currently, when contractors conduct construction, demolition, and/or renovation work at City owned facilities or rights-of-way, those vendors frequently provide the City with paper copies of project plans and specifications. Often, these documents contain information about the location of electric, telecommunications, water, storm water, waste water, and other infrastructure because the vendor needed this information to complete design and construction work.

Sometimes, conditions at project locations require vendors to deviate from the proposed plans and specifications to complete construction. In those instances, vendors typically provide clients with “as-built” drawings to document the project as constructed, which differs from the 100% design documents. However, the City has not always obtained these documents from vendors.

The City should institute a **Document Control and Standardization Policy** requiring vendors to submit design plans and “as-built” documents (e.g. plans, schematics, drawings, specifications for materials and equipment etc.) as a pre-condition of receiving final approval of their projects from City reviewers. If the vendor works for the City, rather than another entity performing work in City facilities and rights-of-way, the City also could withhold payment until it receives construction and “as built” plans.

Likewise, the City should require all applicants seeking permits for construction, demolition, and/or renovation work at non-City owned facilities to submit construction design and “as built” documents.

Furthermore, the City should require vendors to submit documents in an editable electronic format (e.g. CADD, GIS) to be determined by the City’s GIS department. PDF documents would not be acceptable. Furthermore, the City could specify the particular type of GIS files it prefers – e.g. ESRI. In certain instances, the City also may require vendors to submit paper versions of documents.

In other words, the City should end its practice of accepting whatever documents vendors provide. Instead, the City should tell vendors what types of documents are an acceptable means of documenting a project and insist that vendors provide information in the required format.

Such a policy would provide the City with information about the location of development and infrastructure that it needs to plan and design an institutional fiber network as well as subsequent network expansions. This information would help the City to plan and build other infrastructure projects and would help City staff who review permits and perform site inspections to perform their work better.

Development and implementation of a **Document Control and Standardization Policy** would involve coordination from several departments, including the departments that accept and approve permits and/or oversee construction like Safety and Permits, Public Works, Property Management and Sewerage and Water Board, the Law department, and the department(s) responsible for paying vendors for work conducted on behalf of the City at a minimum. Furthermore, the Mayor’s Office and the City Council likely would provide input as well.

# APPENDIX H

## Public Policy Recommendation 3: Right of Way Management

**Right of Way Management Policies** delineate the time, place, and manner of construction activities in the right of way per the 1996 Telecom Act. Applicable rights of way could include transportation corridors like highways, arterial roadways, local streets, and railroads as well as the corridors that carry interstate transmission lines for electricity, natural gas, and oil.

Such policies can dictate the types of construction materials to be used, the width and depth of trenches, placement of infrastructure within the right-of-way, and other factors affecting construction work in the right of way. By regulating construction, these policies seek to decrease the cost of road repairs and increase the useful life of roadways.

Implementation of a **Right of Way Management Policy** will require participation from the departments that oversee rights of way in New Orleans such as the City's Department of Public Works and the State of Louisiana Department of Transportation and Development. In addition, the participation of the Sewerage and Water is critical because their projects frequently occupy public right of way.

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## Public Policy Recommendation 4: Joint Trenching or “Dig Once” Policies:

**Joint Trenching or “Dig Once” Policies** are a subset of right of way management policies. These policies minimize repetitive installation of costly broadband infrastructure and allow multiple organizations to use a common trench by outlining rules and/or procedures for sharing.<sup>96</sup>

Any entity that oversees rights of way such as the US Department of Transportation, state departments of transportation, and local government agencies can create and implement a joint trenching policy. For example, Arizona State law, SB 1402, expands access to state ROW by allowing the department of transportation to install conduit in state ROW when other maintenance work is underway in a location and then lease the conduit at a cost-based rate. Once the conduit is installed, private firms can pull fiber through the conduit without a need for construction permits and environmental studies. State officials estimate that the incremental cost of placing conduit during other construction projects is comparable to the cost of painting stripe on the highway.<sup>97</sup>

Vermont, Massachusetts, Tennessee, and Oregon support broadband deployment by making poles, ducts, and conduits available to ISPs. Relying on a federal statute, the Vermont Public Service Board requires utilities to allow ISPs access to utility poles for broadband deployments. Massachusetts requires the same pole access for a broader range of communications, including “transmission of intelligence via wireless communication or any television technology,” cable and telephone services. Tennessee mandates pole access for all video service providers. Oregon requires utilities to allow any entity who needs access to serve its customers to use poles, ducts, and conduits as much as practicable.<sup>98</sup>

Joint trenching policies also could require telecoms to share their trench with competitors. Likely, other ISPs would install their fiber in a separate conduit.

Whether a municipality builds a publicly owned fiber network or encourages ISPs to upgrade their infrastructure (or both), the ability to reduce the cost of laying fiber by using trenches dug for other construction projects could accelerate efforts to improve broadband. Cost estimates for a proposed fiber network in Missoula, MT suggest it could reduce its cost to lay fiber underground by approximately 80% by taking advantage of planned street widening projects.<sup>99</sup>

Implementation of a “Dig Once” policy typically requires the enactment of an ordinance(s) making changes to relevant sections of the municipal public works and/or building codes. These changes will outline the circumstances that trigger the municipality’s interest in installing fiber as part of another entities excavation project and the rules governing the fiber installation.

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<sup>96</sup> Magellan Advisors, “Next-Generation Broadband Feasibility Study” for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, July 16, 2014, pg. 5.

<sup>97</sup> “When State Laws Facilitate Modern Broadband Deployment,” Coalition for Local Internet Choice, November 25, 2014, <http://www.localnetchoice.org/category/connections/>.

<sup>98</sup> “When State Laws Facilitate Modern Broadband Deployment,” Coalition for Local Internet Choice, November 25, 2014, <http://www.localnetchoice.org/category/connections/>.

<sup>99</sup> Magellan Advisors, “Next-Generation Broadband Feasibility Study” for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, July 16, 2014, pg. 53, 54.

For example, San Francisco, CA requires entities applying for street excavation permits with its Department of Public Works to notify its Department of Technology (DT) of the permit application. This notification allows DT staff to determine if DT should install conduit and/or fiber in that location as part of the other entity's project. San Francisco decided that it will review opportunities to install fiber only for excavations larger than a certain size (900 feet). While San Francisco can decline to install its fiber during eligible excavations, their ordinance presumes that the city will participate.<sup>100</sup>

San Francisco's ordinance enacting a "Dig Once" policy also outlines data and information that DT must report on a quarterly basis to the Mayor and Board of Supervisors (their version of a City Council). Required information includes:

- Number of excavation permits issue by Public Works for projects that met criteria for DT participation
- Locations of excavations
- Identities of applicants for excavation permits
- If the excavation permit applicant objected to DT efforts to install fiber as part of the applicant's project
- If DT participated in the permit applicant's project by installing fiber
- The cost of fiber installed as part of the applicant's project
- The status of each fiber installation effort associated with another entity's project<sup>101</sup>

For more information about San Francisco's "Dig Once" policy and the implementation of the policy, visit the following web links:

- San Francisco Dig Once website: <http://www.sfcoit.org/>
- Proposed Information and Technology (ICT) Plan Fiscal Years 2016 -20  
<http://sfcoit.org/modules/showdocument.aspx?documentid=2113>
- San Francisco Dig Once Ordinance  
<https://sfgov.legistar.com/View.ashx?M=F&ID=3319457&GUID=F4269889-DA96-4993-B243-AA71125C3847>
- San Francisco Public Works Code  
[http://www.amlegal.com/nxt/gateway.dll/California/publicworks/publicworkscodes?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco\\_ca\\$sync=1](http://www.amlegal.com/nxt/gateway.dll/California/publicworks/publicworkscodes?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sync=1)
- "Dig Once" Ordinance Implementing Regulations  
<http://sfgov3.org/modules/showdocument.aspx?documentid=6893>
- "Dig Once" specification <http://sfgov3.org/modules/showdocument.aspx?documentid=6885>

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<sup>100</sup> "Dig Once" Ordinance (No. 220-140), City and County of San Francisco, October 6, 2014, pg. 6, 8.

<sup>101</sup> "Dig Once" Ordinance (No. 220-140), City and County of San Francisco, October 6, 2014, pg. 10.

# APPENDIX H

## Public Policy Recommendation 5: Joint Underground Location of Infrastructure for Electric and Telecommunications Policies:

Joint Underground Location of Infrastructure for Electric and Telecommunications (JULIET) policies go beyond joint trenching policies. These policies require the installation of conduits in public rights of way to house all utilities rather than merely mandating that ISPs must share space with each other. As public and private projects construction projects require digging in the right of way, the municipality installs the conduit and moves all utilities, including government owned fiber, into the newly installed conduit.<sup>102</sup>

JULIET saves billions of dollars via the following:

- Eliminates utility poles and maintenance costs thereof
- Eliminates cuts to the street and reduces street maintenance costs
- Eliminates need for Federal Emergency Management funds to restore outages caused by fallen utility poles during storms<sup>103</sup>

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<sup>102</sup> "Launching Local Fiber to the Premise Networks Using JULIET (Joint Underground Location of Infrastructure for Electric and Telecommunications)," presentations by TeleDimensions, pg. 7.

<sup>103</sup> "Launching Local Fiber to the Premise Networks Using JULIET (Joint Underground Location of Infrastructure for Electric and Telecommunications)," presentations by TeleDimensions, pg. 12.



# APPENDIX H

## Public Policy Recommendation 6: Create Geo-Database to Track Construction Projects and Events in the Right-of-Way:

Implementation of a **Right of Way Management Policy** requires municipalities to know the location and characteristics of infrastructure and equipment already in the right-of-way and the location and timing of current and future construction projects and other events that will impact rights of way. This section discusses methods to improve the tracking of construction projects and events while the following section will discuss processes to improve how the municipalities can track their infrastructure, both within public right of way and elsewhere.

**Construction Project and Event Coordination:** Municipalities can establish an office to schedule construction projects to minimize conflicts between projects and maximize opportunities for projects to piggyback on each other. The Chicago Department of Transportation's Project Coordination Office uses an automated database to schedule projects by City departments and utilities and meetings to resolve conflicts between projects. The City's Office of Underground Coordination maintains and dispenses all information about utilities and reviews/approves all work in or adjacent to public rights-of-way.<sup>104</sup> Besides making it easier to coordinate fiber installation and other broadband infrastructure projects, this strategy can generate savings to reinvest into a fiber network. Once the municipality perfects project coordination among its agencies and utilities, it can expand coordination to include private construction projects.

**Construction Project and Event Mapping:** Coordination of construction projects requires mapping all planned capital projects – street rehabilitation, streetscape upgrades, sewer upgrades, modifications to street lights and traffic lights, etc. – in the public ROW for the next 5 to 10 years. This effort will help create a common operating picture for infrastructure projects and allow a municipality to coordinate fiber installation with other projects.

Based on Santa Monica's experience, installing conduit as part of another project to avoid paying digging costs could save 30% to 55% or \$30K to \$100K per mile on deployment costs. Once the conduit is in place, fiber can be "pulled or blown" later at minimal cost. In New Orleans, this will require coordination between Sewerage & Water Board, Department of Public Works, Louisiana Department of Transportation and Development, private utilities, and other entities that build in the right-of-way.

Municipalities should make the geocoded information on construction projects and other events available to the public via the internet as San Francisco, CA and Austin, TX do.

**San Francisco:** The City and County of San Francisco maintain a web-accessible, geocoded database of utility (road, water, sewer, transit, streetscape, gas, electric, and telecom) construction projects and events to help public and private sector entities coordinate various projects.

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<sup>104</sup> "City Project Coordination Save \$10 M in First Year," Efficient Gov, February 20, 2014, <http://efficientgov.com/blog/2014/02/20/city-project-coordination-saves-10m-first-year/> (accessed March 2014).

To see San Francisco's data, visit <https://envistacitizensview.appspot.com/sanfran.jsp>. To view their "Dig Once" ordinance, visit <https://sfgov.legistar.com/View.ashx?M=F&ID=3319457&GUID=F4269889-DA96-4993-B243-AA71125C3847>. As of March 2015, San Francisco is working to create policies to implement its "Dig Once" policy.

**Austin:** The City of Austin, TX has a website to allow residents to access information about projects in its Capital Improvement Program (CIP). This website enhances project coordination by showing conflicts between projects and notifying project managers so they can resolve the conflicts. Availability to the public via desktop and mobile devices enhances transparency to stakeholders.

Users can access a list of projects, geocoding for projects that can be mapped, data visualizations, and datasets used as well as information about a project's lead agency, what funds are paying for the project, and the project manager's contact information. The address is <http://austintexas.gov/civic>.

**Construction Project and Event Timing:** In addition to the location of current and planned projects and events, coordination of multiple projects in public rights-of-way also requires information about the timing of the projects. Therefore, the geodatabase of projects also should track project timing in a manner that allows people to view all projects occurring in a location during a specific time period. This information should be available in geospatial (map), table, and calendar form.

The calendar view should include project schedules for ongoing and planned projects with start dates up to some specified future date beyond which people cannot predict the initiation of project related tasks. Ideally, the calendar would include large projects overseen by all municipal departments and agencies as well as private construction. In New Orleans, the master calendar should include projects sponsored by the Department of Public Works, the Sewerage and Water Board, and Capital Projects at a minimum.

**Conclusion:** In summation, the geo-database should track project location, phasing, and other pertinent information such that a municipality will know when and where other entities plan to dig a trench in the street allowing the municipality to reduce costs to lay fiber for itself and telecoms by coordinating fiber installation with previously planned digging. This type of coordination likely would require regularly scheduled meetings between ITI and departments that regularly conduct and/or oversee construction in the ROW to ensure that information in the geo-database is correct.

# APPENDIX H

## Public Policy Recommendation 7: Create Geodatabase to Document Physical Assets in the City:

Mapping is the process of identifying, measuring, evaluating, and geocoding physical assets. Efforts to design a fiber network and coordinate fiber installation with other construction projects will require the City to know the location, ownership, and key attributes of existing and planned fiber infrastructure, utilities, buildings, and vacant land in addition to current and future construction projects and events.

As with information about construction projects and other events, the City will need a geo-database to house information about physical assets in the City. This database will allow the City to know which sites its institutional network can/should serve and which sites are available to host network infrastructure.

Once physical asset data is in a geo-database, the City will need to dedicate human and financial resources to maintain data accuracy. The sections below discuss the types of physical assets the City should map.

**Physical Property:** To implement an institutional fiber network, the City must know the location, ownership, and key attributes of the buildings, lots, light poles, electric poles, rights-of-way and other physical assets in New Orleans. Therefore, the City should create and maintain a geo-database of all property in New Orleans, including property owned by the City, property in public (federal, state of Louisiana, Orleans Parish, other government entity) ownership, and property owned by non-public sector (private, non-profit, philanthropic) entities.

Of particular interest to the City will be property it owns. It is likely that the fiber network will serve certain City owned sites like buildings in active use. On the other hand, unused City owned sites may not require access to the network; instead, the City may be able to use these locations to host networking equipment like switches or as conduits for fiber.

Creating a geo-database of all property in New Orleans will require planning to determine what types of data to collect and the location of this data. Geo-database creation also will require intensive data collection via researching property records and performing surveys, geodatabase design, and data entry.

The City could perform this work using City employees. However, given the size of the undertaking, it would be difficult for City employees to accomplish this task while performing regular job duties. The City possibly could enlist resident volunteers to perform survey work as Shutesbury, MA (population 2000) did.<sup>105</sup> However, the use of volunteer surveyors likely is not feasible for New Orleans due to its large geographic size.

Due to constraints discussed above, it is likely that the City will have to pay consultants to create its geodatabase unless it can get the project completed on a pro-bono basis.

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<sup>105</sup> Igonzalez, "Small Town Volunteers in Massachusetts Begin Pole Inventory," Community Broadband Networks, November 6, 2014, <http://muninetworks.org/content/small-town-volunteers-massachusetts-begin-pole-inventory>.

**Broadband Infrastructure:** Efforts to design a fiber network and coordinate fiber installation with other projects also will require the City to track the location of telecom network assets throughout the City, regardless of ownership. Ideally, the geo-database also would track:

- Broadband infrastructure (fiber, conduit, vaults, pull boxes, transitions, other outside plant resources) already installed
- Broadband infrastructure that will be installed and the expected date of installation
- Name of fiber owner
- Categorize owner as public, private, or non-profit sector
- Type of fiber – aerial or in-ground
- Condition of fiber – lit or unlit
- Relevant details about equipment type
- Any other pertinent information

The City would need to perform a survey to determine the location and other characteristics of existing broadband infrastructure and enter this information. Thereafter, the City could maintain the relevancy of the geo-database by requiring permit applications to install broadband to include this information. Ideally, applicants would submit an editable electronic file that City staff could load into the geo-database.

# APPENDIX H

## Public Policy Recommendation 8: Encourage Fiber Network Deployment:

This section identifies potential policies municipalities could enact to incent fiber network deployment. Some measures focus on internet service providers. Other measures focus on the developers of residential and commercial projects. Some measures contain possible requirements and others contain potential incentives. Areas of consideration for policy changes include:

- Broadband engineering standards for renovation/construction of City-owned and operated buildings and facilities
- Broadband access standards for new residential and commercial construction in New Orleans
- Standards for franchise agreements with telecom firms
- Standards for partnerships with other entities that may become customers of a municipally owned fiber network
- Procurement processes
- Permitting standards
- Incentives for telecoms to improve their services
- Other policies and procedures that the City oversees

Development and implementation of policies to support telecom network upgrades and/or expansion by New Orleans existing ISPs and fiber network deployment by new ISPs will require agreement from stakeholder departments.

### Broadband Engineering Standards – City-Owned and Operated Facilities

Most municipalities purchase high-speed broadband for their office buildings and other facilities for employees to use in their jobs. As a large enterprise organization, the City can afford to buy the fastest broadband available in New Orleans. However, the price and the bandwidth the City receives for that price pale in comparison with the broadband offered in cities with the best broadband. To promote world class broadband in New Orleans, the City can start by ensuring that City government provides the fastest speeds to government facilities.

Building an institutional fiber network is likely to be the best way to accomplish this goal because it provides IT staff with the most control over their broadband network in terms of bandwidth, latency, security, redundancy, ability to expand or upgrade service, and other factors affecting broadband quality.

Because many City facilities are open to the public, one of the ancillary benefits of providing a first-class fiber network to New Orleans government facilities is that the City can showcase high-speed broadband to the public at its facilities, thereby increasing the number of New Orleanians who are aware of the possibilities inherent with gigabit fiber service.

**Publicly accessible kiosks in City facilities:** For example, the City could provide internet kiosks in the One Stop Shop to allow people to apply for permits online in the waiting area. Likewise, there could be kiosks in the public waiting areas of other departments, like the Department of Finance, to allow residents to pay bills to the City. A staff person could assist people with using the kiosks to complete transactions.

In this way, some constituents who traveled to City Hall to apply for a permit or pay a bill via a face-to-face meeting may be able to complete their application online and avoid the face-to-face meeting. This option could save constituents time and introduce them to online transactions with government and high-speed broadband.

In addition to providing constituents with the opportunity to use high speed broadband to complete tasks at City facilities as described above, the City should continue providing wifi at publicly accessible City facilities to allow constituents to perform other tasks while they wait to meet with City staff or elected officials.

## **Broadband Access Standards – Residential and Commercial Construction**

Municipalities typically regulate the siting and appearance of telecommunications towers and other equipment via the zoning code to preserve their communities' aesthetic qualities. More recently, many communities have used the comprehensive plan, zoning code, and other regulatory tools to accomplish other tasks like promoting broadband deployment to improve broadband access.

Creating policies to foster fiber deployment would require collaboration between ITI, planning staff, City Planning Commission, the Law department, and potentially other departments.

**Comprehensive Plan:** Municipalities that wish to promote broadband deployment in their communities can state this intention in their comprehensive plan (aka master plan), a document that dictates a community's public policy for transportation, utilities, land use, recreation, and housing over a long-term time horizon.<sup>106</sup>

New Orleans did this in August 2010 when it adopted "A Plan for the 21<sup>st</sup> Century: New Orleans 2030." New Orleans' comprehensive plan lists "state of the art telecommunications infrastructure, including broadband, fiber optic, wireless, and cable" as a goal for community facilities, services, and infrastructure. This plan also recommends that the City make capital investments and implement strategies to ensure the resilience of its communications and telecommunications infrastructure and "promote fiber to the home and upgrades of broadband technology."<sup>107</sup>

Project staff suggests that the next version of New Orleans comprehensive plan address how the City can use broadband to promote other goals like:

- Reduced energy use through smart grids
- Reduced energy use, travel, congestion, and pollution through telecommuting
- Workforce development through online training
- Economic development through business attraction

**Zoning Code:** Once a municipality's master plan includes an intention to improve its telecommunications infrastructure, then the municipality typically updates its zoning code, the specific rules and regulations that implement the master plan's intentions by defining the use, form, and design of development in different locations in the community.

Due to the regulatory nature of a zoning code, updating it to foster fiber deployment is a more complex process than updating a master plan. Many municipalities looking to promote fiber deployment often

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<sup>106</sup> Wikipedia - [http://en.wikipedia.org/wiki/Comprehensive\\_planning](http://en.wikipedia.org/wiki/Comprehensive_planning) (accessed March 26, 2015).

<sup>107</sup> "A Plan for the 21<sup>st</sup> Century: New Orleans 2030," Executive Summary, pg. 90.

incorporate broadband access standards into so-called “smart” land development codes. Typically, such standards encourage or require:

- New construction to be built to accommodate connection to existing and future fiber networks
- Multi-family housing to avoid exclusive deals with a single ISP, thereby preserving residents’ access to multiple telecoms when choosing internet services.

**Fiber Connection Equipment Requirements:** Typically, these codes require new construction to include fiber connection equipment within individual buildings (or units for multiple unit properties) or at nodes within the development so the occupants can connect to existing or future fiber networks. Thoughtful codes contain a provision for periodic review (once every 5 or 10 years) to ensure that the required telecom hookups facilitate access to state-of-the-art technology rather than obsolete technology.<sup>108</sup> These codes may require fiber hookups for all new developments or may limit regulation to certain land uses (e.g. new residential projects), or may apply only to projects of a certain size (e.g. more than a certain number of units or above a certain square footage).

Alternatively, “smart development codes may require developers to designate small plots of land in their developments for telecommunications equipment like utility boxes for fiber head ends and/or install mount points for wifi antennas on light poles. For more information about sample regulations to encourage telecom infrastructure deployment, visit the following websites:

[www.mrsc.org](http://www.mrsc.org)

[www.apwa.net](http://www.apwa.net)

[www.baller.com/pdfs/updated\\_primer\\_on\\_pole\\_attachments.pdf](http://www.baller.com/pdfs/updated_primer_on_pole_attachments.pdf)

To achieve the most impact, smart development codes should apply to public, commercial, residential, and industrial construction<sup>109</sup> and perhaps to transportation and other infrastructure projects as well, if those infrastructure projects would benefit from broadband access.

However, because enterprise organizations often can afford a fiber connection and monthly service fees, many smart development codes focus on promulgating standards for residential construction only.

**Multi-family Housing Requirements:** Some “smart” development codes prohibit the developers and owners of multi-family buildings from making exclusive arrangements with one ISP to serve the building. If prohibiting such arrangements is not possible, municipalities may develop tools to encourage developers to allow their tenants to choose among the ISPs that serve their community.

**Broadband Requirements for Public Housing:** Although municipalities may be able to insist that developers install fiber connection equipment in anticipation of future fiber service, municipalities cannot force developers of unsubsidized, private projects to install fiber.

However, if a municipality contributes money to a development project (whether privately or publicly owned), the municipality could choose to make its willingness to subsidize the project contingent upon the inclusion of an independent “advanced communications network.”

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<sup>108</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 18.

<sup>109</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 13.

The “advanced communications network” must enable the provision of affordable, market-comparable high-speed broadband to all units. As with non-subsidized housing, the network should let residents select their providers and choose the services they need without buying unwanted services. In other words, if data, video, and voice are offered, providers should offer bundled and a la carte options.<sup>110</sup>

Ideally, this would foster competition between the different ISPs serving the development and reduce cost of broadband for its low-income residents. In addition, market comparable broadband offers the same or greater bandwidth and data limits as luxury residential projects within that same community.

Implementation of this strategy would involve educating developers and operators of publicly subsidized housing and their agency partners that the homes will be more attractive with affordable broadband access. For example, studies indicate that fiber raises the value of single family homes by \$5,000 - \$6,000 on a home valued at \$300,000. Owners of multiple dwelling units rated broadband access as the most important feature by a large margin; renters rated broadband as the second most important feature. The presence of FTTH can increase sale price by 3% and rents by 8%.<sup>111</sup>

In New Orleans, major stakeholders to this proposed policy would be the New Orleans Redevelopment Authority (NORA), the Housing Authority of New Orleans (HANO), public housing residents, and potentially the US Department of Housing and Urban Development (HUD), which often provides funds to build public housing.

**Conduit Installation Requirements:** Requirements that entities digging trenches for transportation, utility, and other infrastructure projects install conduit have become more common as municipalities update codes to encourage fiber installation. Some communities also require entities constructing a development project to install conduit, if their work disturbs existing roads or builds new roads. Sandy, UT and Mt. Vernon, WA have taken this approach.<sup>112</sup>

Requiring those digging in established rights-of-way or building new streets to install conduit regardless of whether the work is associated with a building project or an infrastructure project can be a viable approach for communities that need to install conduit quickly. The community could choose to install its fiber in the conduit or allow telecommunications firms to install fiber for a reasonable fee.

Implementation of this policy would require cooperation from multiple entities, including the City’s Public Works department, the Sewerage and Water Board, and the Louisiana Department of Transportation and Development. These entities would need to update their procedures to allow or require conduit installation during in-ground utility (e.g. water, waste water, storm water, electricity, gas, etc.) and street reconstruction and rehabilitation projects.

**More Resources:** In its report, “Next-Generation Broadband Feasibility Study,” prepared for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, Magellan Advisors, included broadband infrastructure standards in Appendix B beginning on page 69.

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<sup>110</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 19.

<sup>111</sup> Igonzalez, “FTTH Adding Value to Apartments and Condos, Studies Show,” Community Broadband Networks, April 28, 2015 (<http://muninetworks.org/content/ftth-adding-value-apartments-and-condos-studies-show>).

<sup>112</sup> Igonzalez, “Smart Conduit Policy in Sandy, Mount Vernon Reduces Network Cost,” Community Broadband Networks, June 14, 2013, <http://www.muninetworks.org/content/smart-conduit-policy-sandy-mount-vernon-reduces-network-cost>.



## Telecom Franchise Agreements

Municipalities negotiate franchise agreements with private firms to provide utility services like potable drinking water, electricity, gas, telecommunications, and waste water services. These agreements typically give private firms the right to serve the community, usually for a specific number of years, and to install the necessary equipment for providing those services in municipal rights-of-way. Depending on the infrastructure system, locations for equipment installation may include on top of the ground, in the ground, or in the air on buildings or poles.

Often, near the end of the franchise term, the firm and the municipality will negotiate a new franchise agreement. The new agreement may be the same as the previous agreement. However, it is more likely that the terms of the new franchise agreement will differ slightly because the firm and the municipality each will try to alter aspects of the agreement to provide it with slightly more benefit.

Typically, the utility firm agrees to pay fees to the community to use its rights-of-way. Although there are many possible methods to calculate these fees, many franchise agreements stipulate that the firm pays the municipality a certain percentage of revenue. Some agreements include a minimum or maximum amount the firm will have to pay.

In the case of telecom firms, franchise agreements are usually non-exclusive, which means that the municipality can negotiate additional agreements with other ISPs giving those firms the ability to use municipal rights-of-way to install their equipment pursuant to offering services.

Like most municipalities, New Orleans has franchise agreements with multiple telecom firms. Each franchise agreement differs in terms of fees to be paid to the City and the duration of the agreement.

**Equipment Sharing Provisions:** In recent years, municipalities have recognized the franchise agreement as a tool to encourage telecoms to upgrade legacy cable and DSL systems to fiber. These municipalities take advantage of the franchise renewal process to include provisions that make it easier for all of the community's telecom franchisees to install equipment. Example provisions include:

- Requirements that each ISP share its towers and monopole sites with other ISPs
- Requirements that each ISP share its conduit with other ISPs

From the telecom perspective, requiring ISPs to share the equipment used to mount equipment increases the number of sites available to each ISP because they can use towers, monopoles, and conduit owned by other ISPs. This gives the ISP more flexibility in network design, reduces its costs, and may make it financially feasible for the ISP to expand and/or improve service.

From the municipal perspective, requiring ISPs to share equipment can result in fewer towers, monopoles, and conduits installed leading to less trenching in the right-of-way, less damage to city streets, less money spent by the municipality on street repair, and less disruption for constituents.

**Master Franchise Agreements:** To ensure that franchise agreements with telecoms (and other utilities) include the desired provisions, some municipalities develop a template or master franchise agreement to use as a starting point in negotiating agreements with telecoms. Others may develop a list of key provisions to insert into a proposed franchise agreement that the telecoms provide. The key is that the municipality determines beforehand what provisions must be in the agreement and has those provisions ready to provide to the telecom. This can help municipal staff negotiate a better deal with telecoms.

**Franchise Duration:** The duration of a telecom franchise varies. Some last for as little as 5 years; others extend for 20 years or more. As expected, there are benefits and disadvantages associated with very short agreements and benefits and disadvantages associated with very long agreements.

One drawback to short-term franchise agreements is the hassle of negotiating on a more frequent basis causing municipal staff and firm employees to expend more time on negotiations. However, for some municipalities and firms, the possibility to improve the agreement (from their perspective) on a frequent basis offsets the hassle of frequent negotiations. Because agreements with a short term may be subject to more frequent scrutiny, the renegotiation process may increase transparency and the possibility of receiving feedback on the agreement from interested observers.

While franchise agreements with a long duration may save the municipality and the firm the time associated with frequent negotiating, both entities may not achieve desired objectives if conditions change and the agreement no longer serves their purposes. However, if the municipality and the firm are amenable, they could renegotiate the franchise several years before its expiry date. In this manner, they provide themselves with the benefits of longer terms (less frequent required negotiations) and the benefits of shorter terms (the ability to alter the agreement if desired).

To ensure telecom agreements meet community objectives, municipalities must avoid negotiating poor franchise agreements with a long term in case the franchisee refuses to re-negotiate the agreement before its expiration date.

**Track Franchisee Payments:** Most telecom franchise agreements require the private firm to pay the municipality to use its rights-of-way. In the past, many cities did not have sufficient staff to ensure the ISPs paid their fees. In some municipalities, telecoms did not pay fees for many years. To avoid the non-collection of fees, municipalities, including New Orleans, could register franchise agreements electronically. The system should include the fee structure and due dates of required payments and automatic generation of reminders that the franchise fee is due. These reminders could be sent to the telecoms and to the staff responsible for collection of this revenue.

Ideally, the City could set aside some of the telecom franchise fees to fund broadband initiatives.

## Partnerships with State and Federal Government Entities

**Inter-agency and Inter-jurisdiction Cooperation:** Because other government agencies likely have similar needs for an affordable high-speed broadband network that can be upgraded and/or expanded without the risk pushback from telecoms, these agencies represent possible partners for the City if it builds an institutional fiber network. In common with the City, other government entities:

- Need backhaul and middle mile infrastructure
- Could collaborate on broadband applications like telemedicine or a regional library network<sup>113</sup>

Potential partners' involvement could include any of the following:

- Purchasing broadband from a City owned institutional network
- Allowing the City to use its assets (e.g. buildings, rights-of-way, poles) to install equipment
- Contributing to network planning and design

In other regions of the country, different government agencies have collaborated successfully to improve their access to high speed broadband. For example, both Washington, DC and Alexandria, VA provide broadband to federal agencies with offices in their jurisdictions.

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<sup>113</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 21.

If the City were to consider partnerships with other agencies, it would be prudent to develop guidelines for interagency and inter-jurisdictional cooperation beforehand.

## Procurement Processes

**Start procurement work early:** Timing and leverage are crucial to successful procurement; experts in enterprise purchasing advise organizations not to wait to renegotiate their agreements with vendors.<sup>114</sup> If renegotiations commence early enough, the customer reasonably could find a new vendor to provide the product or service. However, it is difficult to procure complex products like telecom services at the last minute. Vendors realize this and are less likely to agree to terms more favorable to the customer when they know the customer cannot take its business elsewhere.

Telecoms seem to follow this mantra. Project staff observed that telecoms often approach the City to renegotiate franchise agreements several years before the agreement's expiry date.

Procurement experts' advice to start work early applies to the City's effort to build an institutional fiber network. In this instance, the preliminary work should focus on gathering information needed to understand the products and services to be requested in the RFP.

**Consider an RFI/RFP process:** EPB, the electricity provider in Chattanooga, TN, built a fiber network to help manage its power distribution network. EPB issued a series of Requests for Information (RFI) to research the technology, equipment, and technical and professional services it would need to build its desired network. EPB also used the RFI process to learn about the firms that offer the products and services it would need to build its network. This research allowed EPB to write a Request for Proposals (RFP) that was sufficiently tailored that respondents would provide them with viable options but broad enough to generate multiple options for EPB to compare.

In phone conversations with EPB procurement staff, they credited the RFI/RFP process for their success procuring the appropriate vendors, services, and equipment to build the network. Responsible use of preliminary RFIs can help municipalities understand the types of responses their RFP is likely to generate before they issue it and can ensure that staff is knowledgeable enough to evaluate the RFP responses.

**Require a standard format for RFP responses:** Procurement experts also advise that organizations to require vendors to enter their information into a standardized RFP response format. This will make it easier for the organization issuing the RFP to compare responses.<sup>115</sup>

## Permitting Standards

Permits are written orders granting permission to perform an act. Municipalities issue permits to private actors giving permission for many activities, ranging from hosting a parade or installing tables and chairs on the sidewalk to provide a restaurant with additional seating to constructing a building. Applications for permits for more complex actions often require negotiation between staff reviewing the application and the applicant.

As with franchise agreements, the permit negotiation process offers an opportunity for municipalities to require items that improve broadband infrastructure or to develop incentives to encourage telecoms to

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<sup>114</sup> C. Douglas Jarrett and Rick Sigel, "Best Practices for Acquiring Telecommunications Services," Slide 11.

<sup>115</sup> C. Douglas Jarrett and Rick Sigel, "Best Practices for Acquiring Telecommunications Services," Slide 15.

improve broadband infrastructure. The following list includes possible provisions to include in permits with telecoms to make it easier for ISPs to upgrade their networks.

**Install Equipment to Accommodate Future Expansion:** To minimize the need for frequent disruptions to public rights-of-way for utility work, some municipalities require private ISPs to install underground and overhead facilities that are large enough to accommodate future expansion and technology upgrades.<sup>116</sup>

Such regulations try to foster the more efficient use of the towers, poles, structures, and ROWs that host telecom network infrastructure. In addition to requirements to anticipate future equipment installation, municipalities also may regulate the placement of each utility's infrastructure. For example, within a ROW, space located a certain distance from the curb and a certain depth below ground may be dedicated to telecom infrastructure while storm water infrastructure occupies a different portion of the ROW. Such rules can simplify the process of regulating equipment installation by providing clear guidelines to utilities and to municipal staff. This can save telecoms and municipalities time and money and reduce inconvenience to constituents.

**Equipment Sharing Provisions:** Municipalities also can require ISPs to share equipment with other ISPs to obtain permit approval.<sup>117</sup> For example, a municipality may require a telecom to accommodate competitors' equipment within or on their underground and overhead facilities. This could apply to conduit used for underground installation and to tower or monopole sites. This is useful if the municipality and the telecom did not include such provisions in their franchise agreement.

**Reduced Permit Fees:** In response to the argument that the cost of permit fees is a disincentive for telecoms to expand or upgrade their networks, some municipalities reduce permit fees in an attempt to encourage ISPs to improve their networks. In reality, municipal permit fees represent a small portion of the cost to deploy network infrastructure. Therefore, it is unlikely that telecoms neglect network improvements due to permit fees.

**Expedited Permits:** Other municipalities offer the telecoms different incentives to encourage desired behavior. For example, many municipalities adopt ordinances to create a streamlined permit review process.<sup>118</sup> In exchange for the expedited or "fast track" review, the telecom provides something the municipality wants.

**Benefits Communities Can Request:** In exchange for providing lower permit fees or faster processing of permit applications, municipalities can request many benefits.

- **Fiber Donation:** Some municipalities ask ISPs to donate a certain number of fiber strands for municipal use. Typically, when telecoms donate fiber to a community, the ISPs limit municipal use of donated fiber to serving public facilities like schools, libraries, and community centers and forbid the municipality from serving businesses and residences.

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<sup>116</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 19.

<sup>117</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 19.

<sup>118</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 13.

Therefore, municipalities must know how they'd like to use community owned fiber. If the municipality may want to serve constituents in their homes and businesses, it may be more prudent to request money to pay to install fiber that will not have restrictions on its use.

- **Money:** Municipalities that reduce permit fees to obtain benefits from telecoms value other items more than money. However, municipalities that offer expedited permits could charge higher fees for the expedited process compared to the normal process and use the extra money to pay for broadband-related programs, including the deployment of community owned fiber.

Unlike fiber donations, fee payments typically do not come with restrictions on how the money can be used.

- **Affordable broadband:** Municipalities also may request a viable plan to provide high bandwidth, low cost service to low income people in exchange for lower fees or faster permit processing. This may involve the telecom providing a data only option or increasing the number of a la carte choices to allow low income people to find an affordable plan that meets their needs.

If the telecom agrees to provide low income people with affordable service, the municipality and the telecom would have to define "affordable" based on incomes of the community's low income people.

To enforce the agreement, the municipality could insist the ISP begin serving low income people within a specific amount of time after the permit date. The municipality also could require that the telecom pay the full fee initially and issue a refund once the affordable, low income broadband has been operational for a specified time period. Other enforcement mechanisms include fines and/or permit revocation if the ISP does not comply.

In this manner, municipalities can use telecoms' desire to obtain permits quickly to secure infrastructure, broadband services, or money to use to improve the broadband access within their communities. Regardless of what the community requests as payment for the expedited permit review process, it should be consistent with principles of fairness and competition.<sup>119</sup>

**Long-term Permits:** While some municipalities limit permit duration to a short time span, others create long-term permits that give ISPs the right to enter specified easements for an indefinite or significant amount of time (e.g. 20 years) to upgrade broadband, consistent with other adopted policies.<sup>120</sup> Municipalities hope that eliminating the need for telecoms to request a permit each time they need to enter the right-of-way will encourage telecoms to upgrade equipment more frequently, thereby enabling telecoms to provide better service.

Benefits of this strategy include reduced workload for permit reviewers because ISPs will submit those less frequently. On the other hand, municipalities lose the opportunity to use the permit process to track what entity is performing what work in its ROWs. In theory, the municipalities could require ISPs to

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<sup>119</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 13.

<sup>120</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption," California Emerging Technology Fund, October 2010, pg. 19.

inform them of upcoming work even with the long-term permit. It's unclear that ISPs will comply if they don't have to seek permission to perform the work.

**Permit Process Revisions:** Any effort to align the permitting process with broadband improvement efforts in a community would require involvement of municipal departments that review permit applications and issue permits to telecoms. In New Orleans, this would include Public Works and Safety and Permits. In addition, ITI and the Law department, and potentially other departments would be involved.

If the City revamped permit regulations to promote broadband deployment, it would need to begin by cataloging all regulations that affect telecom network deployment in New Orleans to understand how current regulations encourage or discourage fiber deployment, both individually and in concert with each other. Once this task is complete, staff could determine whether to retain or modify existing regulations and/or introduce new regulations.

## **Incentives for Telecoms to Improve Service and Reduce Prices**

As documented in the companion report, **"Broadband – the World's Newest Public Utility,"** a complex array of market and regulatory factors affect the deployment of fiber networks and the quality of the services that ISPs offer on those networks. Internationally, many central governments assumed a leadership role in planning and building broadband networks as described in the companion report, **"Broadband Around the World."** However, broadband deployment in the United States has been the responsibility of a lightly regulated for-profit telecommunications industry.

Section 706 of the Telecommunications Act of 1996 requires the Federal Communication Commission (FCC) to determine whether "advanced telecommunications capability [i.e., broadband or high-speed access] is being deployed to all Americans in a reasonable and timely fashion." If this is not the case, the act directs the FCC to "take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."<sup>121</sup>

Section 706 also directs the FCC and its state-level counterparts to encourage reasonable and timely deployment of telecommunications services by utilizing ... price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.<sup>122</sup>

Most observers understand that there is very little competition in the United States telecom market and recognize that promoting competition could improve the quality and reduce the price of broadband. Observers also realize that promotion of competition is extremely difficult for a variety of reasons.

### **Competition in the Telecom Market:**

Generally, business owners and managers, including people who oversee ISPs, invest in improving the quality of their product or service based on the amount of competition. For telecoms, improving quality typically means offering greater bandwidth, increasing or eliminating maximum allowed data usage, and improving customer service. These upgrades usually increase consumers' willingness to pay.

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<sup>121</sup> Broadband & Sec 706, Cybertelecom: Federal Internet Law & Policy: An Educational Project, <http://www.cybertelecom.org/broadband/706.htm>, accessed March 19, 2015.

<sup>122</sup> Broadband & Sec 706, Cybertelecom: Federal Internet Law & Policy: An Educational Project, <http://www.cybertelecom.org/broadband/706.htm>, accessed March 19, 2015.

Therefore, the ISP whose service improves the most gains a competitive advantage and increases its profits. However, if all ISPs improve performance to the same extent, none gains a competitive advantage.<sup>123</sup> While subscribers benefit when all telecoms improve service, most non-subscribers do not benefit. In this instance, increased competition does not reduce prices; therefore, people who cannot afford broadband remain unable to afford broadband. However, a few new people may become subscribers; these are the people who believe that the improved product/service is worth the price whereas the previous product/service was not worth that price.

Because all telecoms can buy the same equipment and implement similar customer service reforms, it is very difficult for one telecom to maintain a competitive advantage based on quality for a long time.<sup>124</sup> Furthermore, investments to improve the quality of a product or service do not significantly improve profits. Because the benefits of investment in improved quality boost profits only a little and are short-lived, there is no strong incentive for telecoms to make this investment.

However, in the face of steep competition, many business owners and managers, including people running telecoms, reduce prices rather than increase the quality of their product or service. Given the negligible profits and short duration of competitive advantages from investments in quality improvement, it is sometimes a better business decision to reduce prices to attract or retain customers.

In summation, when positioning their service in the market, ISP staff must decide whether to compete on price or quality. Because many US telecoms have one or two competitors in the geographic markets they serve and their executives know that new market entrants are unlikely due to the high cost to build a network, many telecoms invest a minimal amount of time, money, and effort in quality. With only a few competitors, there is little incentive to reduce prices either.

Via a series of monopolies and duopolies, the telecoms effectively minimize both price competition and quality competition. Because people need broadband, ISPs can hold subscribers hostage with inscrutable contracts and, in approximately 20 states, laws to reduce competition in the telecom market and maintain the status quo in direct contradiction of the mission outlined in Section 706.

While local governments do not have authority to regulate broadband providers in the same manner as state and federal agencies, as demonstrated by this appendix, local governments have many tools (including but not limited to franchise agreements and permit requirements) that may be used to develop incentives to encourage the telecoms to improve their service. Other ideas are listed below.

**Attract Non-traditional ISP(s) as Competition:** Google Fiber is building a 1 Gbps fiber network in Kansas City, (KS and MO), Austin, TX, and a few other cities. In addition, Google Fiber is buying Provo's (UT) municipally owned fiber network to use to serve Provo's residents and businesses. In Austin, this announcement prompted a promise by AT&T to build its own 1 Gbps network if it can secure an equivalent deal with the municipality.<sup>125</sup>

Other municipalities also can consider trying to attract a non-traditional ISP to offer competing telecom service. This strategy is very difficult to execute. First, firms may be interested in serving markets with a certain number of subscribers and therefore cities with a certain population and average income. Based

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<sup>123</sup> Francois Jeanjean, "Incentives to Invest in improving Quality in the Telecommunications Industry," France Telecom Orange, June 14, 2012, pg. 2.

<sup>124</sup> Francois Jeanjean, "Incentives to Invest in improving Quality in the Telecommunications Industry," France Telecom Orange, June 14, 2012, pg. 2.

<sup>125</sup> "Provo could beat Austin to Google Fiber starting gate," Austin American Statesman Online, Kirk Ladendorf, April 17, 2013 at 4:39 PM, <http://www.statesman.com/news/business/provo-could-beat-austin-to-google-fiber-starting-g/nXPh7/>.

on the cities with which it has partnered, it appears that Google is concentrating on small and medium sized cities with a significant or growing technology sector initially. Many cities will not meet the basic criteria for a partnership.

Second, firms likely will require the municipality to offer a lot of assistance (e.g. money, staff time, information, use of municipal assets) to launch the network. Many municipalities will be unable to provide these items and therefore, will not be deemed as attractive partners. However, for some municipalities, a partnership with a non-traditional ISP may provide the competition to prompt incumbent telecoms to improve broadband quality while reducing prices.

**Convince Incumbent ISPs to Develop Services for Lower Income People:** Sprint developed its US Mobile Broadband on Demand product to serve the US market and expanded it to serve business travelers and expatriates from other nations visiting the United States. Sprint works with Telespree and wholesale partners abroad to offer a both a standalone product and additional back office services. Customers buy a data card from a kiosk, store, or vending machine, plug in and configure the data card for the service plan that meets their needs, and use the Sprint network to access the internet while in the United States. Each Sprint partner can craft specific service offerings and related pricing, billing, logistics, integration, and branding. Usage plans are half-day, full day, weekly, monthly, or by megabyte.<sup>126</sup>

Sprint's ability to modify an existing service offering to meet the needs a specific market segment, residents of other nations who are traveling in the United States, suggests that telecoms can and will develop new products when they see an untapped market.

If US telecoms see evidence that there is demand for low cost, high-speed broadband among low income people and that ISPs can earn sufficient profit, they may be willing to alter existing plans to meet the needs of those people. After all, telecoms abroad earn profits by providing service to a wide range of their nations' populations, including low income people.

American municipalities should work with broadband advocates to educate US telecoms about this unmet demand. In addition, municipalities also have a role to play in increasing the demand for high-speed broadband service by educating people about broadband – both what they can do with it and the mechanics of actually using it.

Once the telecoms realize that providing low cost, high speed bandwidth is feasible, municipalities and broadband advocates could work with ISPs to develop services targeted to low income individuals.

**Leverage City Assets:** Municipalities also could leverage their assets to expand access to underserved stakeholders or to generate revenue to use to expand access to underserved populations. For example, a municipality could lease space on buildings and streetlight poles to firms to build distributed antenna systems to address mobile providers' need for more bandwidth. Then, the municipality could use the money generated to improve access via many methods, including but not limited to, direct subsidy to low income users and expanded access in publicly owned buildings.

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<sup>126</sup> Global Telecoms Business CEO and CFO Guide to Wholesale: July/August 2010, pg. 58-59, [www.globaltelecomsbusiness.com](http://www.globaltelecomsbusiness.com).



## Other Policies and Procedures

In addition to the previous policy suggestions, there are other policies municipalities can enact to encourage broadband access through new fiber network deployment, upgrades of existing networks, reduced prices or other means.

**Internal Business Processes:** Municipalities also can change internal business processes to ensure that their community considers all possible ways to encourage broadband access. Project staff recommends that ITI review permits and franchise agreements with telecoms to ensure the City charges telecoms properly for use of City-owned property and that the City does not agree to terms that limit its future telecom options. ITI review also should ensure that agreements support City broadband access goals.

ITI handles the procurement of telecom products and services for the City. However, there may be instances when individual departments procure telecom products and services. It may be prudent for ITI to review agreements to purchase, lease, or receive donations of telecommunications equipment and/or services negotiated by other departments to ensure these agreements are consistent with the goals in the Broadband Master Plan.

**Damaged Fiber Repair & Replacement:** Municipalities with a publicly owned fiber network should require contractors who cut or otherwise damage the network's fiber, conduit, or other equipment to repair or replace damaged equipment quickly just as they require timely repair and/or replacement of other damaged municipal property. If the entities that damage fiber equipment do not repair or replace that equipment in a timely fashion, the municipality could perform the work and bill those entities for the cost of repair or replacement in addition to a substantial fine.

Municipalities may want to require an inspection before contractors begin work to verify that municipal property is undamaged. Likewise, municipalities may want to require an inspection at the completion of work verify that municipal property remains undamaged. This inspection could occur at the same time as any inspection to verify the proper completion of the contractor's planned work.

Municipalities pursuing this path will need to include language requiring pre-project and post-project inspections within their permit regulations. Depending on the requirements of local and state laws, municipalities also may include language about pre- and post- project inspections within the permit itself. Permitting regulations also will need to include language to address:

- Amount of time contractors have to repair or replace damaged equipment
- Procedures for the municipality to bill the contractor for damaged equipment that is not repaired or replaced
- Procedure for determining responsibility for damage to municipal equipment if multiple contractors are working in the same rights-of-way

# APPENDIX H

## Public Policy Recommendation 9: Innovative Construction Techniques:

Fiber network construction is very expensive. Many organizations that build these networks have limited financial resources. Therefore, staff tries to reduce construction costs via the use of various less expensive construction techniques, some of which are described below.

**Pipe bursting:** Pipe bursting is a technique that destroys old pipe, compacts the debris, and lays new pipe in one operation. The typical method, open excavation, involves digging a trench, installing pipe, and covering the pipe with the excavated materials. The pipe bursting technique saves money. A previous plan by the Sewerage and Water Board to lay fiber along with new pipe in the CBD proposed using pipe-bursting.<sup>127</sup>

The plan also included temporary roadway restoration by contractors upon completion of sewer/fiber conduit work. The SWB planned to perform final roadway restoration later under its annual contract to obtain better prices.<sup>128</sup>

**Microtrenching:** Microtrenching is a relatively new technique that involves installing below-grade telecommunications equipment in a relatively small trench (12 inches deep and 1.25 inches wide) instead of a trench several feet below the surface as with traditional trenching.

Microtrenching hastens the pace of fiber installation. It also results in less damage to streets, decreased need for street repairs, and reduced cost of in-ground fiber installation. Other cities have begun to use microtrenching. For example, New York City's Department of Information Technology and Telecommunications (DoITT) allows entities installing telecom infrastructure, including telecoms and contractors working on behalf of the City, to use microtrenching.

For more information, visit: <http://www.nyc.gov/html/doitt/html/business/business.shtml>

**Smart Pavement:** Firms are developing smart pavements that allow monitoring of environmental conditions and the provision of wifi service and information to passersby.

Madrid uses a system called iPavement. Each calcium carbonate stone has a 5GB microprocessor chip, mesh network and wifi/Bluetooth connectivity. Underground cables power the wireless walkways. This is cheaper than building a wifi network. The technology comes with its own operating system, apps, and a real-time alert system.

New Orleans should evaluate these options along with traditional telecommunications services as it refines exactly what technologies to use in deploying the wired and wireless networks for employees to use to provide public services.

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<sup>127</sup> "New Orleans to Bridge the Last Mile with Dual Purpose Rehabilitation," presented at NASTT Conference, Orlando, FL, April 24 – 27, Joe Becker, Sal Mansour, Wendy Lundeen, and Stephen Paletta, pg. 1.

<sup>128</sup> "New Orleans to Bridge the Last Mile with Dual Purpose Rehabilitation," presented at NASTT Conference, Orlando, FL, April 24 – 27, Joe Becker, Sal Mansour, Wendy Lundeen, and Stephen Paletta, pg. 8.

# APPENDIX H

## Public Policy Recommendation 10: Develop Standards for Siting Broadband Infrastructure:

**Integrate Broadband into Infrastructure Planning:** Municipalities that want to improve broadband access need to develop standards or guidelines to incorporate broadband into development and infrastructure projects. These standards should address multiple issues associated with siting broadband equipment such as where to install equipment within a site, methods of masking the equipment to blend into its surroundings, and overall design of broadband infrastructure.

Proper standards ensure that broadband infrastructure is compatible with environmental quality and visual aesthetics. Standards also help guarantee that rules for broadband infrastructure are consistent with and comparable to requirements for other infrastructure such as street lights, traffic light control equipment, and power generation equipment.<sup>129</sup>

Guidelines help reduce the number of redesigns needed to get to consensus on the final design of visible network infrastructure, which saves the municipality and the telecom time and money.

Guidelines also may entice developers to include broadband in projects. Developers know that consumers want broadband. In the absence of a requirement to provide it and the likelihood of a long, expensive review process to get the infrastructure approved, some developers decide not to include it. The result is that future owners and renters must pay to install the infrastructure or forgo its benefits.

The best guidelines show telecoms examples of acceptable telecommunications equipment in different areas and what types of aesthetic treatments make equipment palatable.

For example, when AT&T sought to expand in Palo Alto, the community opposed towers, and then a distributed antenna system. The community finally approved a less intrusive small cell system after 2 years and several redesigns.<sup>130</sup>

It would save the telecoms time and money if communities provided guidelines allowing the telecoms to limit the number of redesigns. Therefore, guidelines could encourage investment in their networks by telecoms.

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<sup>129</sup> Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption,” California Emerging Technology Fund, October 2010, pg. 13, 19.

<sup>130</sup> “Asset Mapping Catalyzes Broadband Development,” Broadband Communities, November/December 2013, Brian Mefford, pg. 97.

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# APPENDIX I

## Legal Considerations

Many aspects of the Broadband Master Plan, like improving digital literacy education, should not involve legal issues. Other strategies, like using franchise agreements and permit processes to encourage telecoms to improve broadband service, could involve legal implications. Certainly, the deployment of an institutional network to serve City owned sites will involve legal ramifications. Below is a non-exhaustive list of regulations that impact telecommunications service provision by topic area.

### Franchise Agreements

**Cable Communications Act of 1984** (47 USC section 521 et. seq.) and **1992 and 1996 amendments**: requires buildout provisions and prohibits providers from failing to serve certain areas of a community (e.g. areas with lower income residents) and exclusive franchises. The Act also sets the maximum franchise fee at 5% of gross revenues.<sup>131</sup>

Federal Communications Commission Order **FCC 06-180** and **FCC 07-190** require municipalities to provide a franchise agreement to potential franchisees within 90 days (180 days for new applicants), require reasonable buildout terms, and allow existing companies to build without a franchise as long as their technology provides IP services and they serve the retail market. This removes incentives to centralize franchising power.<sup>132</sup>

### Pole Attachment Agreements

Multiple state and federal laws cover pole attachments; these laws apply different standards and rates to different pole attachment entities.<sup>133</sup>

1. **47 USC Section 224** sets the federal standards and rate calculations for poles. States can require owners of poles, ducts, and conduits to make their facilities available to new entrants on a non-discriminatory basis at a reasonable cost. States and local governments can require incumbents to share poles, ducts, and conduits in the public ROW with new entrants.<sup>134</sup>
2. 26 states self-regulate in addition to or separately from the federal standards. **FCC Order 11-50** revises several Section 224 provisions.<sup>135</sup>

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<sup>131</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pg. 7.

<sup>132</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pg. 7.

<sup>133</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pg. 13.

<sup>134</sup> “State and Local Government Role in Facilitating Access to Poles, Ducts, and Conduits in Public Rights-of-Way,” FTTH Council Americas, August 2013, pg. 2.

<sup>135</sup> Second Interim Report Pursuant to State of Washington House Bill 2601, The Technology Law and Public Policy Clinic – University of Washington Law School, June 2011, pg. 13.

## **Louisiana Local Government Fair Competition Act**

Research by project staff uncovered many regulations that could impact plans to build a fiber network or to provide broadband to constituents, including the **Louisiana Local Government Fair Competition Act**. This discovery prompted the City to seek a legal opinion on the impact of these regulations from Baller Herbst, a telecommunications law firm.

# APPENDIX J

## Internet Access Programs for Low Income People

Multiple programs exist to promote affordable broadband for low income people. While these programs represent progress in bringing more people online, they are a stop gap measure, rather than a long-term solution. These programs involve many disadvantages as summarized below.

- They offer less bandwidth at lower cost; therefore, low income subscribers still lack internet parity with their peers.
- Poor marketing means that many low income people are unaware of the programs.
- Complex registration procedures may include photo identification, credit check, or deposit requirements which decrease make it difficult for many low income people to qualify for internet through these programs.
- Some programs do not provide the digital devices and digital literacy training that low income people need to take advantage of lower cost internet.
- Some programs only serve households with children.

Despite shortcomings, existing programs have brought internet access to some low income people. Absent better options, the City could encourage low income people to take advantage of existing New Orleans area programs if they meet the eligibility criteria while the City works on attracting better programs to the City.

Programs that may be able to help low income New Orleanians obtain broadband access now include Lifeline and Connect to Compete. The text below describes these programs as well as programs offered by other ISPs in different regions.

By encouraging low income people to take advantage of existing programs, the City can help them begin to develop digital literacy skills. Ideally, this will ensure that more low income people are ready to take advantage of affordable, higher bandwidth service when that becomes available. Helping low income people to improve their digital literacy skills also may increase the number and percentage of New Orleanians who desire affordable, high-speed internet access.

### Lifeline

In 2012, the Lifeline Reform and Modernization Order was implemented. It allocated \$25M saved from other programs to test how Lifeline, a program run by the Federal Communications Commission (FCC) that provides free or low-cost phone service to people with poverty-level incomes or who are enrolled in certain government programs like Medicaid, can be used to increase broadband adoption among Lifeline eligible consumers.<sup>136</sup>

Starting in 2013, 14 pilot projects in 21 states received \$13.8M. Each of the 14 projects has different service terms with respect to choice of wired or wireless broadband, subsidy amount, availability and duration of subsidies for up-front equipment costs, ongoing user charges, and/or digital literacy training,

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<sup>136</sup> "FCC-backed bill would subsidize broadband for low-income homes" on the Verge website, Jacob Kastrenakes, April 24, 2013, <http://www.theverge.com/2013/4/24/4260530/fcc-lifeline-assistance-program-broadband-internet-discounts>.

amount of end-user charges, access to digital literacy training, equipment type, bandwidth ranges, data usage limits, and advertising and outreach methods. Enrollment for the 14 projects ended November 1, 2013.<sup>137</sup>

In Louisiana, Nexus, in partnership with Digital Ohio, is testing the effect of subsidy amounts and digital literacy on internet adoption by offering differential subsidies (\$0, \$15, and \$20) to three groups based on zip code. The subsidies lower the price for a menu of internet plans that vary by usage limits. By allowing customers to choose their usage limits, Nexus will be able to report subscribers' willingness to pay for data limit increases and learn if subscribers were satisfied with their choices. The same set of options is being tested in California, Iowa, Michigan, Mississippi, Nevada, and New Jersey. Other plans that test different factors affecting broadband adoption are being tested in other locations.<sup>138</sup>

The Broadband Adoption Act of 2013 would update Lifeline by offering program participants a choice between discounted telephone, mobile, and internet services, effectively mandating the extension of the pilot program.<sup>139</sup>

### **Connect to Compete**

Connect to Compete – 13 broadband cable providers spanning 50 states offer 1 mbps internet service for \$9.95 + tax to families of children eligible for free school lunch.

Go to their website <http://www.connect2compete.org/>, answer a few questions, and learn what programs are available to assist with broadband access.

### **Internet Essentials**

In an attempt to assuage FCC concern about its proposed merger with NBC Universal circa 2010, Comcast created Internet Essentials, ostensibly to help low income Americans access broadband. Comcast promised to serve approximately 2M low income households.<sup>140</sup> The program offers broadband to low income families for \$10 a month. As of August 2013, 220K households out of 2.6M eligible households (about 8%) in Comcast service areas had registered for the program.<sup>141</sup> Despite serving only a small fraction of eligible households, Comcast earns about \$18M per year from this program.<sup>142</sup>

Early program requirements that participants qualify for free lunches in the National School Lunch Program, have children enrolled in public school (thereby excluding low income families whose parents enrolled them in private or parochial schools), not owe Comcast money or equipment, not have Comcast broadband service, and not have had service in the last 90 days meant that many low income households did not qualify.

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<sup>137</sup> FCC website: <http://www.fcc.gov/encyclopedia/low-income-broadband-pilot-program>.

<sup>138</sup> FCC website: <http://www.fcc.gov/encyclopedia/louisiana-broadband-pilot-program-projects>

<sup>139</sup> "FCC-backed bill would subsidize broadband for low-income homes" on the Verge website, Jacob Kastrenakes, April 24, 2013, <http://www.theverge.com/2013/4/24/4260530/fcc-lifeline-assistance-program-broadband-internet-discounts>.

<sup>140</sup> "Using the Franchise to Organize Against Comcast," Community Broadband Bits— Episode 124, Interview with Hannah Jane Sassaman, November 11, 2014, <http://muninetworks.org/content/using-franchise-organize-against-comcast-community-broadband-bits-episode-124>.

<sup>141</sup> "Most of U.S. Is Wired, but Millions Aren't Plugged In" NY Times, Edward Wyatt, August 18, 2013 - [http://www.nytimes.com/2013/08/19/technology/a-push-to-connect-millions-who-live-offline-to-the-internet.html?\\_r=0](http://www.nytimes.com/2013/08/19/technology/a-push-to-connect-millions-who-live-offline-to-the-internet.html?_r=0) (accessed November 2013).

<sup>142</sup> "Using the Franchise to Organize Against Comcast," Community Broadband Bits— Episode 124, Interview with Hannah Jane Sassaman, November 11, 2014, <http://muninetworks.org/content/using-franchise-organize-against-comcast-community-broadband-bits-episode-124>.



After complaints from Philadelphia, PA residents, Comcast expanded the program to families that qualify for reduced price lunch and increased downstream speeds from 1.5 mbps to 3 mbps (it retained 768 kbps upstream) to meet the generally accepted minimum definition of broadband.<sup>143144</sup> Subsequently, Comcast upgraded maximum download bandwidth to 5 mbps.<sup>145</sup>

In February 2014, Comcast announced that it would continue the 3-year Internet Essentials pilot program indefinitely.<sup>146</sup> Many people criticized this program. Observers claimed that the program:

- Ignores needs of poor people without children (singles, elderly)
- Is not reliable because Comcast can discontinue it at any time
- Offers subscribers one fifth the service for one fifth the cost<sup>147</sup>

Furthermore, it is difficult to enroll in Internet Essentials because it is a separate program with a different website and phone number from Comcast's regular telecom offerings. Consumers who call Comcast's regular number to request the low cost internet learn about a promotional triple play package, not Internet Essentials. Often, the enrollment process takes 2 to 3 months, partly because customers without social security numbers must travel long distances to verify their identities.<sup>148</sup>

Therefore, only high information, persistent consumers register for Internet Essentials, whereas the people who need the program typically are low-information consumers who often have language and/or education barriers and lack time or internet access to research their choices.<sup>149</sup>

In California, Comcast also conducted credit checks (which often worsened applicants' credit ratings) or required a \$150 fee to avoid the credit check. In California, only 11% of eligible households registered for the service,<sup>150</sup> likely because they could not afford to pay to avoid the credit check and felt they would not pass the credit check.

In summation, Internet Essentials provides low income people with access to less bandwidth at lower cost; therefore, the program does not provide parity between low income people and their peers with

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<sup>143</sup> Philly Forces Comcast to Broaden \$10 Broadband Offer After Promising it as Condition of NBC Merger, Karl Bode September 24, 2012, <http://www.dslreports.com/shownews/Philly-Forces-Comcast-to-Broaden-10-Broadband-Offer-121335>

<sup>144</sup> "Using the Franchise to Organize Against Comcast," Community Broadband Bits— Episode 124, Interview with Hannah Jane Sassaman, November 11, 2014, <http://muninetworks.org/content/using-franchise-organize-against-comcast-community-broadband-bits-episode-124>.

<sup>145</sup> Igonzalez, "Consumerist Sounds Off on Internet Essentials and Comcast's Hidden Agenda," *Community Broadband Networks*, April 9, 2014.

<sup>146</sup> "Comcast Indefinitely Extends Low-Cost Broadband for Poor Families," NY Times, Edward Wyatt, March 4, 2014 - [http://bits.blogs.nytimes.com/2014/03/04/comcast-indefinitely-extends-low-cost-broadband-for-poor-families/?\\_php=true&\\_type=blogs&nl=todaysheadlines&emc=edit\\_th\\_20140305&r=0](http://bits.blogs.nytimes.com/2014/03/04/comcast-indefinitely-extends-low-cost-broadband-for-poor-families/?_php=true&_type=blogs&nl=todaysheadlines&emc=edit_th_20140305&r=0) (accessed March 2014).

<sup>147</sup> Igonzalez, "Consumerist Sounds Off on Internet Essentials and Comcast's Hidden Agenda," *Community Broadband Networks*, April 9, 2014.

<sup>148</sup> "California group critiques Comcast's low-income service," Speedmatters, July 24, 2014, [http://www.speedmatters.org/blog/archive/california-group-critiques-comcasts-low-income-service/?utm\\_medium=email&utm\\_source=speedmatters&utm\\_campaign=20140728WeeklyUpdate](http://www.speedmatters.org/blog/archive/california-group-critiques-comcasts-low-income-service/?utm_medium=email&utm_source=speedmatters&utm_campaign=20140728WeeklyUpdate).

<sup>149</sup> Igonzalez, "Consumerist Sounds Off on Internet Essentials and Comcast's Hidden Agenda," *Community Broadband Networks*, April 9, 2014.

<sup>150</sup> "California group critiques Comcast's low-income service," Speedmatters, July 24, 2014, [http://www.speedmatters.org/blog/archive/california-group-critiques-comcasts-low-income-service/?utm\\_medium=email&utm\\_source=speedmatters&utm\\_campaign=20140728WeeklyUpdate](http://www.speedmatters.org/blog/archive/california-group-critiques-comcasts-low-income-service/?utm_medium=email&utm_source=speedmatters&utm_campaign=20140728WeeklyUpdate).

more financial resources. Furthermore, the many barriers to enrolling in Internet Essentials further mute the program's impact is because very few people actually enroll.

### **Internet Basics**

Century Link's Internet Basics offers low income people discounted high-speed internet, discounted personal computers, and access to free computer and internet training programs. In all of CenturyLink's local service markets, Internet Basics offers eligible low income customers high speed internet for \$9.95 a month for a full year. Discounted service for \$14.95 per month is available for an additional 4 years. Internet Basics also offers a new, internet-ready netbook computer for \$150, and free training and tools in more than 100 communities nationwide. For more information, view their website:

[http://broadband.louisiana.gov/lbi\\_citizens\\_InternetBasics.asp](http://broadband.louisiana.gov/lbi_citizens_InternetBasics.asp)

### **Internet.org**

Internet.org is a global partnership of Facebook, Ericsson, MediaTek, Nokia, Opera, Qualcomm, and Samsung. Their focus is to bring internet access to the 2/3 of the global population (about 5 billion people) that lacks internet access. These partners will develop joint projects, share knowledge, and mobilize industry and government to bring the world online. Internet.org focuses on making mobile internet access affordable, using data more efficiently, and helping businesses drive access. Although the focus is on the developing world, innovations resulting from this project may be applied later to address differential access in developed nations.<sup>151</sup>

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<sup>151</sup> Facebook website: <http://newsroom.fb.com/News/690/Technology-Leaders-Launch-Partnership-to-Make-Internet-Access-Available-to-All>.

# APPENDIX K

## Digital Literacy Training – New Orleans

Project staff developed a non-exhaustive list of organizations that offer basic digital literacy training and/or free access to broadband enabled computers in New Orleans as listed below.

### New Orleans Public Library

The New Orleans Public Library (NOPL) is a resource for community members who wish to improve their digital literacy skills. All NOPL locations are equipped with the following:

- 6 to 45 publicly accessible, internet-ready PCs with MS Office installed, depending on location
- Wifi
- 2 ipads that patrons can borrow for in-library use<sup>152</sup>

Most NOPL branches do not have a separate computer lab; the PCs are amongst the stacks of books.

Conversations with library staff revealed that many NOPL computer patrons do not have computers or internet access at home. Generally, patrons can use computers for 2 hours at a time. If demand for computers is low, patrons get an additional hour for a total of 3 hours per session.

At most locations, staff with other responsibilities assist individual patrons as needed. However, the New Orleans East Regional branch has 1 full-time staffer to assist patrons and a computer lab. At the time of the survey, only a few NOPL locations provided formal digital literacy training, as shown below:

- Central City – Friday computer classes
- MLK – planned to resume computer classes in the fall
- New Orleans East Regional – 2 computer literacy classes
- Gentilly – general technology class
- Rosa Keller – open computer tutoring on Saturdays<sup>153</sup>

For more information, visit <http://www.neworleanspubliclibrary.org/~nopl/info/info.htm>.

### Sojourner Truth Neighborhood Center

The Sojourner Truth Neighborhood Center in Faubourg-Lafitte offers job training, health and wellness, financial education, after-school, and senior programs. The center has a computer lab and offers computer and internet education.

**Contact:** Andreanecia Morris – 508- 827-9963

### Tulane University Medical School

Tulane University's Medical School offers free one-on-one computer classes that teach computer basics, typing, Microsoft Word, internet basics, setting up an e-mail, and creating a job resume.

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<sup>152</sup> Survey of NOPL locations by project staff, July 2013.

<sup>153</sup> Survey of NOPL locations by project staff, July 2013.

For more information, visit <http://tulane.edu/som/bfhhc/computer-literacy.cfm>. or <http://tulane.edu/som/bfhhc/upload/Computer-Access-and-Literacy-Resource-Guide-updated-November-2013-4.pdf>

To register for a class visit <http://www.jotform.us/sgoodma/computerliteracy>

People who can use email, surf the web, and type a document are welcome to volunteer as instructors by calling 504-609-3583.

## JOB1 Business and Career Solutions

JOB1 connects job seekers and employers who are hiring. JOB1 also provides employment and training services through the Workforce Investment Act (WIA) as described in the table below.

<b>Services for Job Seekers</b>	
Job Search and Placement Assistance	Resume Development and Job Readiness Seminars
Labor Market Information and Case Management	
Career Development Services	Occupational Skills Training, Comprehensive and Specialized Assessments
Access to Equipment	Access to Computers, Fax Machines, and Copy Machines
Supportive Services	Transportation Assistance, Child Care/Dependent Care, and Tools, Uniforms, Drug Tests, and other items needed to secure and maintain employment
<b>Services for Employers</b>	
Employee Recruitment Services	
On-the-Job Training-	Up to six months of wage subsidy to employers for cost of training employees on the job
Customized Training	Training designed to meet the special requirements of an employer or group of employers. The employer must commit to employ or continue to employ an individual upon successful completion of the training.
Logistical Support	Interview Space at the Career Center
Workforce Assessment	Employee Skills Information, Assessment of Incumbent Worker Skills
Other Information	Employment and Labor Market Statistics, Information on Tax Incentives, Employee Lay-Off Assistance

In addition, JOB1 provides access to GoTo Interview, (<http://www.gotointerview.com/>), which allows job seekers to build a profile for review by 90+ prospective New Orleans and Houston employers. Jobs listed cover a range of skill levels in hospitality, financial services, security, and other industries. Profiles may include a job application, a resume, a picture, a video, and references. If selected for an interview, employees can create a webcam answering employer-submitted questions. Use of the webcam reduces the need to for face-to-face interviews. Employees can create their webcam at home or at JOB1 offices, depending on their skills and computer and internet availability.

**Contacts:**

Kaneisha Manuel - [kaneisha.manuel@gotointerview.com](mailto:kaneisha.manuel@gotointerview.com) or 504-267-9317 or 504-756-9957

Crystal McDonald - [crystal@gotointerview.com](mailto:crystal@gotointerview.com)

**NORDC – SUNO Digital Literacy Project**

In 2013, The New Orleans Recreation Development Commission (NORDC) partnered with Southern University at New Orleans (SUNO) to develop a youth and adult digital literacy pilot program to be hosted in NORDC community centers with a scheduled launch in 2014. NORDC also may consider operating computer labs for public use when formal classes are not in session. If NORDC opens the computer labs and begins classes, this will offer New Orleanians another option in digital literacy training.

For more information and the phone numbers of individual programs and NORDC community centers, please visit <http://www.nola.gov/nordc/>.

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# APPENDIX L

## Digital Literacy Training – Other Programs

Project staff understands that successful digital literacy training programs developed in other locations potentially could benefit New Orleanians. This includes programs rooted in a specific geographic location and programs that exist entirely online.

An increase in the number of programs would provide New Orleanians with more opportunities to learn digital literacy skills. The advent of new programs would provide New Orleanians with more types of digital literacy curriculum. Ideally, this would increase the likelihood that constituents will find a program that meets their needs for digital literacy training. This section highlights digital literacy training programs from outside New Orleans and provides links to more information.

### **BizFriend.ly**

BizFriend.ly, an online learning and sharing community, is collaboration between Code for America and Kansas City (KS and MO) to assist the 48K small businesses in the area. It goes beyond basic computer skills to provide online tools for small to mid-sized businesses to help entrepreneurs start, run, and grow great businesses. The site's lessons, which were created by entrepreneurs, business experts, and community organizations for entrepreneurs, teach business owners to perform tasks to run their businesses online.

See <http://bizfriend.ly> for more information.

### **Black Girls Code**

Black Girls Code teaches young and pre-teen girls of color technology skills like computer programming and game design while introducing them to role models in the technology industry. The program also teaches parents the importance of technology and financial and digital literacy. Although the program initially focused on African Americans, its scope has expanded to include Latinas, too.

The program, which was founded in the Bay Area, also offers events in New York City and Memphis. Based on their website, a parallel program Black Boys Code should launch soon.

For more information, visit their website: <http://www.blackgirlscode.com/>.

## Bronx Academy for Software Engineering

The Bronx Academy for Software Engineering (BASE) requires students to take 4 years of programming, software design, and application development in addition to traditional coursework. Across all disciplines, the curriculum focuses on helping students learn to solve problems. Students' senior projects must apply design thinking and software engineering to address a community need.<sup>154</sup>

Extra-curricular activities include math clubs, computer aided design, anime/manga, 3D printing, business start-up workshops, individual and small group tutoring, SAT preparation, and student government.<sup>155</sup>

For more information, visit the website at <http://bronxsoftware.org/>.

## CFY Digital Learning Program

The CFY Digital Learning Program works directly with public schools to help low income students increase academic achievement to the same level as peers from households with more money. Using student assessment data, a teacher, parent, or computer algorithm selects learning activities using various modalities for a student. Upon completion of the learning activities and re-assessment of the student, a teacher, parent, or algorithm selects a new set of learning activities for the student. As the cycle continues, each step offers an opportunity to select activities to meet specific education goals like improving skills in which the student does not excel or allowing a student to explore subjects of interest and to tailor learning modalities to the student's needs. The digital learning program also offers students a chance to select their learning activities and foster student ownership of the learning.<sup>156</sup>

Components of the Digital Learning Program include:

- Professional Development to show teachers how to blend learning strategies in the classroom, extend learning beyond the classroom, and engage families in the learning process
- Family Learning Workshops to show families and children how to learn together so they can continue the process at home
- Home Technology Support for families to provide a refurbished computer with educational software, free online subscriptions to more educational software, 24x7 bilingual help desk support and information about affordable broadband options<sup>157</sup>

Impacts of the CFY program are listed below.

- During the 2012-2013 academic year, schools using the CFY Digital Learning Program increased their statewide percentile ranking by an average of 10 percentile points compared with the prior year. The percent of students meeting proficiency standards on math assessments determined statewide ranking.
- In one New York City school, the percentage of 2011-2012 sixth graders with learning disabilities who met or exceeded math standards increased by 36%, nine times the citywide increase of 4%.

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<sup>154</sup> BASE website: [http://bronxsoftware.org/apps/pages/index.jsp?uREC\\_ID=259041&type=d](http://bronxsoftware.org/apps/pages/index.jsp?uREC_ID=259041&type=d) (accessed May 1, 2015).

<sup>155</sup> BASE website: [http://bronxsoftware.org/apps/pages/index.jsp?uREC\\_ID=259041&type=d](http://bronxsoftware.org/apps/pages/index.jsp?uREC_ID=259041&type=d) (accessed May 1, 2015).

<sup>156</sup> CFY website, <http://cfy.org/what-we-do/our-approach/> (accessed April 27, 2015).

<sup>157</sup> CFY website, <http://cfy.org/what-we-do/the-cfy-digital-learning-program/> (accessed April 27, 2015).



The percentage of sixth graders with learning disabilities who were far below standards decreased by 23% from 23% to 0%.<sup>158</sup>

## **Coalition for Queens**

The Coalition for Queens operates several programs aimed at increasing the diversity of the technology sector in Queens, NY.

Via an intensive 9-month curriculum, the Access Code program provides tech training to individuals from under served and under represented communities to prepare them for entry-level developer jobs at startups and tech companies. In the first iteration of the program, graduates increased their annual salaries from \$26,000 to \$73,000.

For more information, visit <http://www.c4q.nyc/>.

## **Code Academy**

Code Academy is an education company focused on building net native education. Their curriculum teaches students to code, which enables participants to obtain technology sector jobs. For more information, visit <http://www.codecademy.com/>.

## **Digital Connector Program – Raleigh, NC**

The City of Raleigh operates the NC Digital Connectors Program which teaches computer, financial, and leadership skills to teenagers. Subsequently, the teens volunteer to teach basic computer skills to community members. For more information, visit:

<http://www.raleighnc.gov/home/content/ITechAdmin/Articles/Digitalconnectors.html>

Contact = Gail Roper, CIO, City of Raleigh, NC

## **Federal Smart Communities**

The Federal Smart Communities program provided basic internet training in English and Spanish to individuals and small businesses in Chicago. Between 2008 and 2011, program participants registered a 15 percentage point increase in internet use compared with other Chicago community areas.<sup>159</sup>

## **Flatiron School**

New York City's Flatiron School offers software engineering, web design, and entrepreneurship training. The pre-college academy, which focuses on high school students, operates for about one month in a city before moving to the next location. This allows the academy to offer 2 and 4 week modules to students.

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<sup>158</sup> CFY website, <http://cfy.org/impact/> (accessed April 27, 2015).

<sup>159</sup> "Most of U.S. Is Wired, but Millions Aren't Plugged In" NY Times online, Edward Wyatt, August 18, 2013 - [http://www.nytimes.com/2013/08/19/technology/a-push-to-connect-millions-who-live-offline-to-the-internet.html?\\_r=0](http://www.nytimes.com/2013/08/19/technology/a-push-to-connect-millions-who-live-offline-to-the-internet.html?_r=0)

Cities to be served in 2015 include Austin, Boston, Chicago, New York City, Los Angeles, Miami, Philadelphia, and San Francisco.<sup>160</sup>

The school offers adult programs at 2 New York City campuses. The Manhattan campus hosts part-time and immersive courses in web development, iOS development, front end development, Android development, and data science. The Brooklyn campus offers a 22-week Web Development Fellowship to New York City residents 18 and older who do not have a college degree or professional web development experience and who make less than \$50,000 per year.<sup>161</sup>

## Google Digital Literacy and Citizenship Curriculum

Google's Digital Literacy and Citizenship curriculum prepares students to evaluate the credibility of online content, create a positive online reputation, identify tricks and scams, and collaborate online among other topics.

To access lesson plans, visit

- <http://www.google.com/goodtoknow/web/curriculum/>
- <https://www.google.com/edu/training/get-trained/digital-citizenship/basics.html>.

In addition, Google offers training on other topics like Gmail, Google Docs, Google Drawings, and Google Drive, which can be access at: [https://www.google.com/edu/training/get-trained/?utm\\_referrer=](https://www.google.com/edu/training/get-trained/?utm_referrer=).

## IBM P-TECH

IBM's Pathways in Technology Early College High Schools (P-TECH) is a 9 to 14 program that aims to close the gap between young people's college and career aspirations and the specific skills they need to gain employment in high-growth industries. In addition to coursework, students participate in mentoring, workplace visits, job-shadowing, and internships as they prepare for specific careers.

Typically, school districts work with colleges and employers to create a P-TECH program. Upon program completion, participants have earned a high school diploma and an associate degree. There are P-TECH schools in New York and Illinois.

For more information, visit: <http://www.ptech.org/>

## LINK AMERICAS Digital Literacy Information Website

The LINK AMERICAS Foundation has created a website with links to websites that demonstrate how technology can serve humanity and digital literacy training – website: <http://www.ictliteracy.info/>.

Potentially useful programs featured on LINK AMERICAS digital literacy website include:

- Job Scout – free online platform that teaches basic internet skills needed to find a job –
  - PC / Mac: <http://myjobscout.org/>

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<sup>160</sup> Flatiron School website: <http://precollege.flatironschool.com/> and [http://go.flatironschool.com/hubfs/Precollege\\_Schedule.pdf](http://go.flatironschool.com/hubfs/Precollege_Schedule.pdf), (accessed May 1, 2015).

<sup>161</sup> Flatiron School website: <http://flatironschool.com/courses> and <http://flatironschool.com/nycfellowship/>, (accessed May 1, 2015).

- Apple smartphones & tablets:  
<https://itunes.apple.com/us/app/jobscout/id594391780?mt=8>
- Google / Android: <https://play.google.com/store/apps/details?id=com.jobscout&hl=en>
- K-12 Open Courseware Resources: <http://www.ictliteracy.info/open-courseware.htm>

## **MacArthur Foundation Digital Media and Learning**

Beginning in 2005, the MacArthur Foundation investigated:

- How young people are changing due to their use of digital media
- How learning environments are changing and how they should change in the future
- How civic and social institutions are changing and how they should change in the future

Since 2009, MacArthur has shifted its focus to promoting and testing “connected learning” that allows people to learn anywhere rather than relegating education to a classroom. For more information, visit <http://www.macfound.org/programs/learning/strategy/>.

## **Microsoft Digital Literacy Project**

Microsoft offers a digital literacy program. Courses focus on the following topics:

- Basic computing
- Internet/Cloud Computer/World Wide Web
- Productivity programs
- Computer security and privacy
- Using technology to advance a career

Students can complete coursework via the internet if they have a broadband connection. People with dialup will need to download lessons. People without internet access can take classes in person at approved learning centers. Email [upinfo@microsoft.com](mailto:upinfo@microsoft.com) to learn about learning centers in your area.

For more information on the Digital Literacy Project, please visit their website:

<http://www.microsoft.com/about/corporatecitizenship/citizenship/giving/programs/up/digitalliteracy/default.aspx>.

For information on the impact of imparting digital literacy skills, please visit:

<http://www.microsoft.com/About/CorporateCitizenship/Citizenship/giving/programs/UP/digitalliteracy/CaseStudies.aspx>.

## **New York State – Online Digital Literacy Instruction Materials**

New York State posts instruction materials on basic computer literacy, MS Word, and using the internet online at <http://www.digitlity.org/> or <http://www.digitalliteracy.gov/>.

Individual state agencies also try to foster technological literacy among New York residents. For example, the New York State Department of Corrections promotes digital literacy for inmates to help them re-enter civil society. The program includes thinking and analytical skills and ethics as well as computers basics, software, internet communication and security, and how to evaluate information found on the internet.<sup>162</sup>

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<sup>162</sup> New York State Universal Broadband Strategic Roadmap - June 2009, pg. 35.

The New York State Department of Labor wants to develop computer games that teach workforce skills because 90% of students of all abilities can learn rapidly with gaming. NYS DOL also wants to promote telework internships as a low-risk way to familiarize businesses with benefits of telework.<sup>163</sup>

## Tech Goes Home

Tech Goes Home (TGH) offers digital literacy education in Boston, Chattanooga, and other cities. Using a “train the trainer” format, TGH staff train community educators (e.g. staff at libraries, Boys and Girls clubs, YMCA, YWCA, community centers, churches, etc.) to teach digital literacy. Organizations can host classes in places the target population frequents. Because teaching the classes becomes an added job duty of existing staff, there is no need to hire new employees which saves money.

The 15-hour digital literacy training, which focuses on “Live, Learn, Earn, Work, and Play,” teaches participants to use broadband to accomplish tasks they need to perform in daily life.

Boston participants receive a \$50 Chromebook upon program completion. The program chose Chromebooks because they were cheaper than refurbished computers. This price represents a significant discount to the \$250 price of a Chromebook.

TGH also helps program graduates register for home internet with Mobile Beacon. Mobile Beacon’s terms include a 4G connection with no data caps, the ability to connect multiple devices, and no contract for \$10 per month. TGH works with Everyone On to connect schools, non-profits, and community based organizations to affordable internet service. TGH offers marketing collateral to advertise the program.

TGH staff train community educators at cost; therefore the main expense is the discounted Chromebooks or whatever digital device the program offers to graduates. Typically, communities raise the funds to pay for devices for program graduates from grants and donations. For more information, please visit the following websites:

<http://www.techgoeshome.org/>

<http://www.mobilebeacon.org/>

<http://www.mobilebeacon.org/everyoneon/>

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<sup>163</sup> New York State Universal Broadband Strategic Roadmap - June 2009, pg. 38.

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# APPENDIX M

## More Resources

This appendix lists resources to visit for more information about topics covered in the Broadband Master Plan.

- Municipal utilities – [www.appanet.org](http://www.appanet.org)
- “Next-Generation Broadband Feasibility Study,” prepared for the BitterRoot Economic Development District, The City of Missoula, and Missoula County, MT, Magellan Advisors, includes a sample document containing broadband infrastructure standards in Appendix B beginning on page 69 of the report.
- Christopher Mitchell – Institute for Local Self Reliance. Expert in municipal broadband finance; very helpful.